Calibration of HET/EPT Flight Models using data obtained in thermal Vacuum

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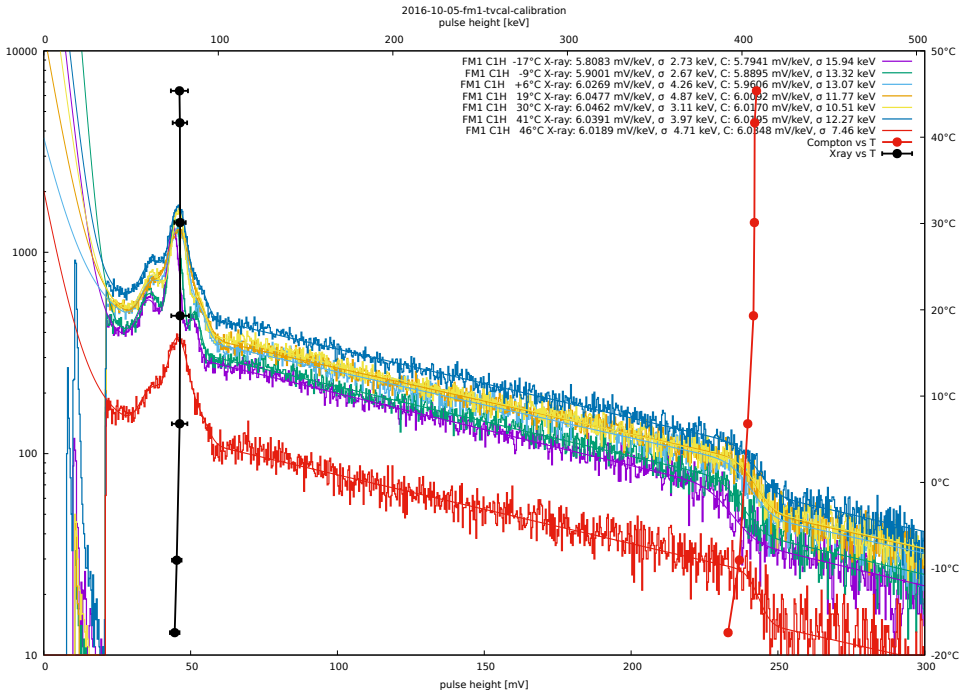

Figure 1: FM1 channel C1H summary.

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Table 1: HET channels

Name	PA gain	shaper gain	channel
A11H	1/10 pF	×15	6
A11L		×1	8
A12H	1/10 pF	×15	21
A12L		×1	9
B11H	1/10 pF	×15	1
B11L		×1	0
B12H	1/10 pF	×15	2
B12L		×1	3
B13G	1/1 pF	×2.4	7
C1H	1/1 pF	×15	5
C1L		×1	4
C2H	1/1 pF	×15	18
C2L		×1	20
B21H	1/10 pF	×15	11
B21L		×1	10
B22H	1/10 pF	×15	13
B22L		×1	12
B23G	1/1 pF	×2.4	19
A21H	1/10 pF	×15	16
A21L		×1	17
A22H	1/10 pF	×15	15
A22L		×1	14

1 The Instrument

This document describes the pre launch calibration of the *High Energy Telescope* and *Electron Proton Telescope* flight models for the *Energetic Particle Detector* suite on the Solar Orbiter spacecraft (EPD HET/EPT).

1.1 High Energy Telescope

HET consists of four silicon *Solid State Detectors* (SSD) with two or three segments each, and a *Bismuth Germanium Oxide* (BGO) scintillator, which is read out via two silicon photodiodes from Hamamatsu. The SSD are labeled A1, B1, B2, and A2.

The A detectors have two segments each, A11, A12, A21, and A22. The B detectors have in addition a third segment, B13 and B23. The BGO scintillator is positioned between the B detectors, with readout channels C1 and C2.

Table 2: EPT channels

Name	PA gain	shaper gain	channel	view
C1	1/1 pF	×2.2	28	magnet $-x$
A1			29	
C2			26	foil $+x$
A2			27	
C3			24	foil $-x$
A3			25	
C4			22	magnet $+x$
A4			23	

All but the outermost B detector segments are read out with two gain channels, where the shaper gain differs by about a factor of 15. The full complement of readout channels is listed in table 1.

The light output of BGO is known to be temperature dependent, with variations of order factor 2 over the expected temperature range.

1.2 Electron Proton Telescope

EPT contains four SSD with two segments each, with single gain readout. The center segments are named C, the outer segments A, for *Anticoincidence*. Table 2 also gives the view directions.

1.3 Readout

The detector signals are pulses of charge emitted from silicon detectors within a few nanoseconds. *Charge Sensitice Preamplifiers* (CSA) convert the charge pulse into a voltage step. The gain is defined by the inverse of the feedback capacitance. The feedback capacitance discharges with the time constant of 100 μs. Simple, single pole shapers with partial pole-zero correction convert the voltage steps into unipolar pulses. The shapers provide additional gain. Most HET detectors are read out with two shapers to support a pulse height dynamic range of 16 bit. The shaper outputs are sampled directly by *Analog to Digital Converters* (ADC) at 1 Million samples per second. A linear combination $A = \sum a_i s_i$ of the last 15 samples provides a digital measure for the pulse height in every microsecond. The coefficients can take values from $-3 \ldots +3$. The sum of the coefficients must be is zero. A seconds linear combination B provides a measure for the phase of the pulse with respect to

Table 3: Temperature ranges

Model	Filename	Temperature	Hits
FM1	2016-10-05-fm1-tvcal-x_-17°C	$-17.4012\,^{\circ}\mathrm{C} \pm 0.0016\,^{\circ}\mathrm{C}$	2473809
FM1	2016-10-05-fm1-tvcal-x_-9°C	$-9.0130\,^{\circ}\mathrm{C} \pm 0.0038\,^{\circ}\mathrm{C}$	2799529
FM1	2016-10-05-fm1-tvcal-x_+6°C	$6.7925\,^{\circ}\mathrm{C} \pm 0.0034\,^{\circ}\mathrm{C}$	3734941
FM1	2016-10-05-fm1-tvcal-x_19°C	$19.3059\,^{\circ}\mathrm{C} \pm 0.0032\,^{\circ}\mathrm{C}$	3927941
FM1	2016-10-05-fm1-tvcal-x_30°C	$30.1066\,^{\circ}\mathrm{C} \pm 0.0029\,^{\circ}\mathrm{C}$	3739628
FM1	2016-10-05-fm1-tvcal-x_41°C	$41.6630\,^{\circ}\mathrm{C} \pm 0.0020\,^{\circ}\mathrm{C}$	5507440
FM1	2016-10-05-fm1-tvcal-x_46°C	$45.3719\,^{\circ}\mathrm{C} \pm 0.0094\,^{\circ}\mathrm{C}$	1244188
FM2	2016-10-13-fm2-tvcal-x_-7°C	$-6.9397\,^{\circ}\mathrm{C} \pm 0.0037\,^{\circ}\mathrm{C}$	4524871
FM2	2016-10-13-fm2-tvcal-x_+7°C	$6.7503\,^{\circ}\mathrm{C} \pm 0.0026\,^{\circ}\mathrm{C}$	4722178
FM2	2016-10-13-fm2-tvcal-x_+19°C	$19.3848\,^{\circ}\mathrm{C} \pm 0.0035\,^{\circ}\mathrm{C}$	5088157
FM2	2016-10-13-fm2-tvcal-x_+33°C	$33.3770\,^{\circ}\mathrm{C} \pm 0.0024\,^{\circ}\mathrm{C}$	6072383
FM2	2016-10-13-fm2-tvcal-x_+42°C	$41.8192\,^{\circ}\mathrm{C} \pm 0.0032\,^{\circ}\mathrm{C}$	3196976
FM2	2016-10-13-fm2-tvcal-x_+44°C	$45.0423\,^{\circ}\mathrm{C} \pm 0.0021\,^{\circ}\mathrm{C}$	5956144

the ADC clock. The coefficients used for Solar Orbiter are

$$a_i = \{0, 0, 0, -3, -3, -3, -3, 1, 1, 2, 2, 3, 2, 1, 0\}, \quad (1)$$

$$b_i = \{0, 0, 0, 0, 0, 0, 0, -2, -3, -1, 0, 2, 2, 1, 1\}. \quad (2)$$

These coefficients can be changed in flight, but there is only one set for all channels. Any change may invalidate all previous calibration measurements.

The electronics gain depends on the value of discrete resistors and capacitors, the resulting time constants and pulse shapes. Some capacitors in the HET high gain channels with X7R dialectric may be more temperature dependent.

1.4 Thermal Vacuum Test

Streaming mode data was obtained during calibration runs of both flight models in thermal vacuum, with temperatures measured near the BGO detector between $-17\,^{\circ}\mathrm{C}$ and $+46\,^{\circ}\mathrm{C}$. In this mode, each particle hit detected by the sensor unit is recorded in a *Pulse Height Analysis* (PHA) record. These records were streamed together with general housekeeping data (HK) via the *Electronic Ground Support Equipment* (EGSE) into a disk file.

The data stream was split into files covering separate temperature ranges. The average temperature range was computed for each range. The full list is provided in table 3, with the number of particle hits recorded in each file.

1.5 Source

While the sensor units were tested in thermal vacuum they were stimulated by a radioktive source of the isotope ^{207}Bi. The source was placed between the EPT and HET sensor heads. The prominent emission lines listed by NUDAT 2 are summarized in table 4. Electrons from the source were not able to penetrate the housing walls and reach the detectors. We observed the photoeffect of the x-rays around 75 keV, and the Compton effect of the γ-line at 570 keV. Signals in the BGO from the source could not be observed.

The sensor units were mounted in the chamber with vertically orientented viewing directions. This allowed to record the hits from cosmic muons penetrating the HET detector stack including the BGO.

Table 4: ^{207}Bi emission lines, from NUDAT2.

Process	Particle	Energy	Intensity
Auger K	e^-	56.7 keV	2.9 %
CE K	e^-	481.6935 keV	1.515 %
CE L	e^-	553.8372 keV	0.438 %
CE M	e^-	565.8473 keV	0.147 %
CE K	e^-	975.651 keV	7.03 %
CE L	e^-	1047.795 keV	1.84 %
CE M	e^-	1059.805 keV	0.54 %
XR	γ	10.6 keV	33.2 %
XR	γ	72.805 keV	21.4 %
XR	γ	74.969 keV	35.7 %
XR	γ	84.45 keV	4.31 %
XR	γ	84.938 keV	8.27 %
XR	γ	87.3 keV	3.02 %
	γ	569.698 keV	97.76 %
	γ	1063.656 keV	74.6 %
	γ	1770.228 keV	6.87 %

2 Calibration Fits

For the analysis of the x-ray and Compton spectra the PHA data were filtered by selecting all records where exactly one detector segment has seen energy above a noise threshold. These signals were accumulated into differential

spectra with linear constant binning. The bin width was selected to cover the differential nonlinearity resulting from the ADC resolution.

The scale on the pulse height axis is mV, an aproximation of the shaper output pulse heigth. The data records yield pulse height in units of A. Folding the nominal pulse shape with the a_i coefficients yields $A = 7.873$ for a unit height input pulse. The ADC resolution is $3.3\,\mathrm{V}/2^{12}$. This combines to the mV scale

$$7.873 \times \frac{4096}{3300\,\mathrm{mV}} = 9.772 \frac{A}{\mathrm{mV}}. \tag{3}$$

Models for the spectral shapes were fitted to the histograms, yielding among other parameters the calibration factors `e` in units $[\mathtt{e}] = 1\,\mathrm{mV/keV}$ for the respective detector channel and temperature.

Similar analysis of the BGO signals is described below in section 2.5.

2.1 Gnuplot

The fitting of spectral models was done with Gnuplot version 5.3. For each flight model a large script with more than 1000 lines of code was written. Functions for the models were defined, channel names and numbers defined, filenames and temperature ranges, initial values for all parameters, plots, fits and text output. Fit results are appended to a results file, which is read at the next invocation of the script. Commandline parameters are parsed to control what the invocation of the script shall perform.

2.1.1 Invocation

Without parameters, the script will just print a calibration file using the data from the current results file. The first argument may be `print`, `plot`, `pause`, or `fit`. The commands `print` and `plot` accept a second argument for the output filename. `print` will print the calibration file. `plot` will draw all plots, optionally into a file. `pause` will draw on the screen, pausing after each plot. `fit` implies `plot` and will perform all fits with the results drawn to the screen.

The printed calibration files are in a format that can be included into the L3-Trigger code. They are appended in sections 3.1 and 3.2.

2.1.2 Fit

Gnuplot uses the nonlinear least-squares Marquardt-Levenberg algorithm. We used the options

```
set fit errorvar noerrorscaling.
```

The bin data is assumed to be Poisson distributed. The fit can assume that the provided errors are real, and do not need to be scaled by the reduced χ^2 to calculate the errors. The resulting errors in the parameters were also saved in the results file.

2.2 Spectral Models

This section describes the Gnuplot functions that model the shape of the spectra.

2.2.1 X-rays

X-ray lines in the spectra were modeled with a Gauss distribution

$$f_{\rm pk}(\mathtt{a},\mathtt{e},\mathtt{s},\ x) = \mathtt{a}\ \exp(-\frac{(x-\mathtt{e})^2}{2\mathtt{s}^2}). \tag{4}$$

The group of five x-ray lines was modeled as the sum of five such peaks with a common set of three scaled parameters

$$\begin{aligned} f_{\rm xray}(\mathtt{a_x},\mathtt{e_x},\mathtt{s_x},\ x) &= \textstyle\sum_{i=1}^{5} f_{\rm pk}(S_i I_i\,\mathtt{a_x}, E_i\,\mathtt{e_x}, \mathtt{s_x},\ x) \\ &= f_{\rm pk}(1\times 35.7\times\mathtt{a_x}, 74.969\times\mathtt{e_x}, \mathtt{s_x},\ x) \\ &+ f_{\rm pk}(1\times 23.7\times\mathtt{a_x}, 72.805\times\mathtt{e_x}, \mathtt{s_x},\ x) \\ &+ f_{\rm pk}(0.65\times 8.27\times\mathtt{a_x}, 84.938\times\mathtt{e_x}, \mathtt{s_x},\ x) \\ &+ f_{\rm pk}(0.65\times 4.31\times\mathtt{a_x}, 84.45\times\mathtt{e_x}, \mathtt{s_x},\ x) \\ &+ f_{\rm pk}(0.65\times 3.02\times\mathtt{a_x}, 87.3\times\mathtt{e_x}, \mathtt{s_x},\ x), \end{aligned} \tag{5}$$

where the intensities I_i for the higher energy peaks $E_i \approx 85\,\text{keV}$ are scaled with the relative photo crossection S_i.

Two background terms are added to the spectrum. The gamma Compton background is modeled with an exponential slope. These are mostly high energy Compton electrons that leak out of the detector.

$$f_{\rm bg}(\mathtt{a},\mathtt{e},\mathtt{s},\ x) = \mathtt{a}\ \exp(-\frac{x-\mathtt{e}}{\mathtt{s}}). \tag{6}$$

At about 58 keV we observed a peak from Compton backscatter. This appears when there is matter downstream from the source behind the detector. It is the photoeffect peak of 75 keV x-rays that were scattered back into the detector by 180°.

$$\begin{aligned} f_{\rm spectrum}(&\mathtt{a_x},\mathtt{e_x},\mathtt{s_x},\ \mathtt{a_b},\mathtt{e_b},\mathtt{s_b},\ \mathtt{b_a},\mathtt{b_s},\ x) \\ &= f_{\rm xray}(\mathtt{a_x},\mathtt{e_x},\mathtt{s_x},\ x) \\ &+ f_{\rm bg}(\mathtt{b_a}, 74.969\times\mathtt{e_x}, \mathtt{b_s},\ x) \\ &+ f_{\rm pk}(35.7\times\mathtt{a_b}, 74.969\times\mathtt{e_b}, \mathtt{s_b},\ x) \\ &+ f_{\rm pk}(23.7\times\mathtt{a_b}, 72.805\times\mathtt{e_b}, \mathtt{s_b},\ x). \end{aligned} \tag{7}$$

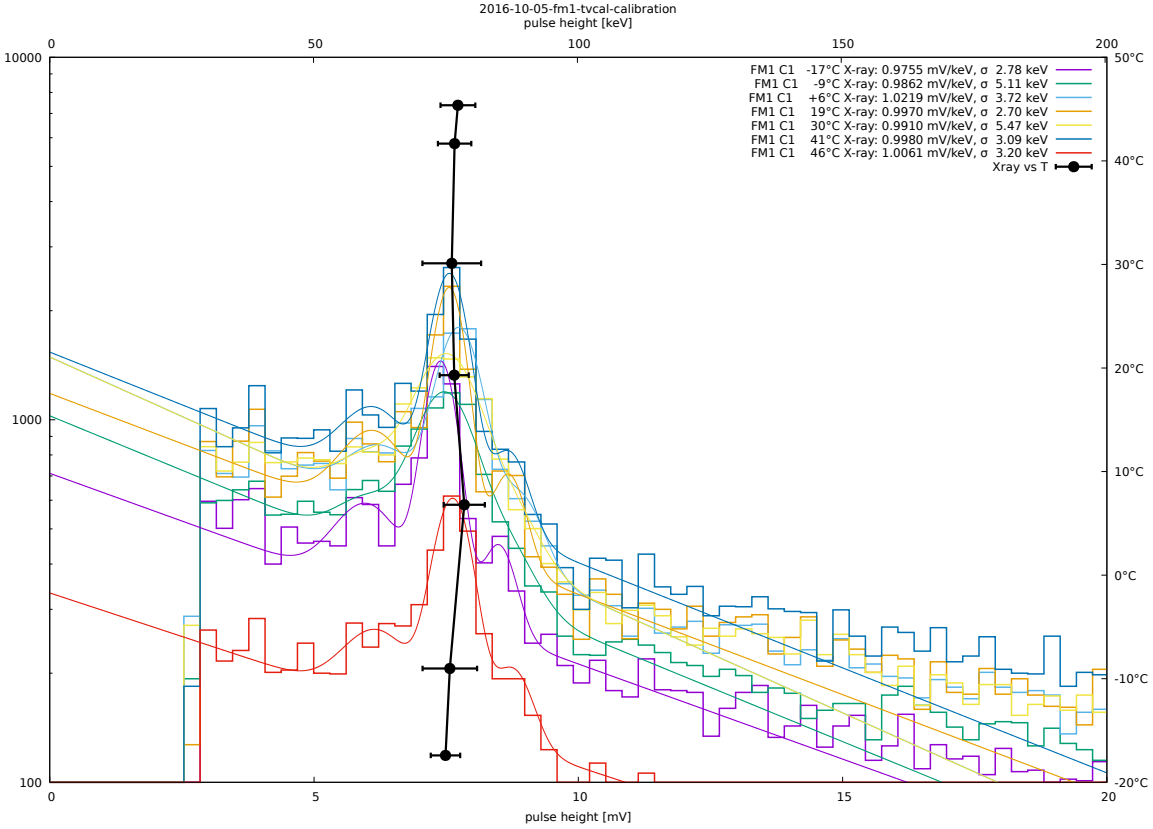

Figure 2: FM1 EPT channel C1 x-rays fits.

2.2.2 Compton Edges

Two gamma lines produce measurable Compton spectra. We only used the line at $E_\gamma = 569.698\,\mathrm{keV}$. The Compton edge energy is $E = 393.306\,\mathrm{keV}$. These Compton electrons have significant probability to leave the detector with unseen energy. In some geometries, background from leaking electrons is suppressed by the anticoincidence condition applied during filtering. The higher energy gammas provide additional background.

The Compton edge model is a constant plus error function, multiplied with an exponential background slope

$$\begin{aligned} & f_{\mathrm{compton}}(\mathtt{a_c}, \mathtt{e_c}, \mathtt{s_c},\ \mathtt{b_a}, \mathtt{b_s},\ x) \\ & \quad = \left(1 + \frac{\mathtt{a_c}}{2\mathtt{b_a}}\,\mathrm{erf}\left(-\frac{x - 393.306\,\mathrm{keV} \times \mathtt{e_c}}{\mathtt{s_c}}\right)\right) \\ & \quad \times \ f_{\mathrm{bg}}(\mathtt{b_a}, 393.306\,\mathrm{keV} \times \mathtt{e_c}, \mathtt{b_s},\ x). \end{aligned} \tag{8}$$

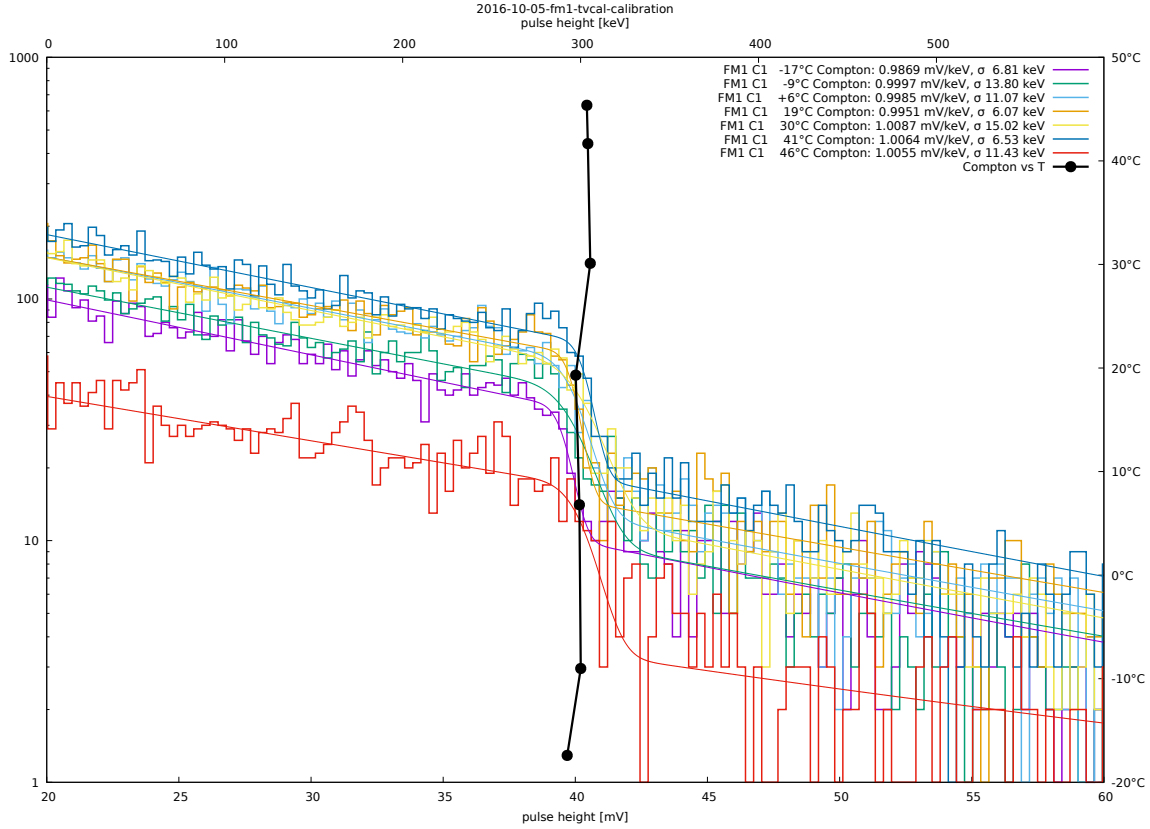

Figure 3: FM1 EPT channel C1 compton fits.

2.3 EPT calibration

Figures 2 and 3 show the x-ray and compton fits for FM1 EPT channel C1. The x-ray fit was applied with five parameters $\mathtt{a_x}, \mathtt{e_x}, \mathtt{s_x}, \ \mathtt{b_a}, \mathtt{b_s}$. The backscatter peak was included with scaled x-rays parameters

$$\begin{aligned} & f_{\text{fit}}(\mathtt{a_x}, \mathtt{e_x}, \mathtt{s_x}, \ \mathtt{b_a}, \mathtt{b_s}, \ x) \\ & \quad = \ f_{\text{spectrum}}(\mathtt{a_x}, \mathtt{e_x}, \mathtt{s_x}, \ \mathtt{a_x}/5, \mathtt{e_x} \times 1.05, \mathtt{s_x} \times 6, \ \mathtt{b_a}, \mathtt{b_s}, \ x). \end{aligned} \tag{9}$$

The scaling factors were optained from attempts to fit the backscatter background parameters as well. When those attempts turned out to cause very unstable fits, the scaling from a few sucessful fits was kept fixed.

The Compton edge fit was run with all five parameters of the model function

$$f_{\text{compton}}(\mathtt{a_c}, \mathtt{e_c}, \mathtt{s_c}, \ \mathtt{b_{ca}}, \mathtt{b_{cs}}, \ x) \tag{10}$$

The lines in the results file for this channel at $T = -17\,^{\circ}\text{C}$ are

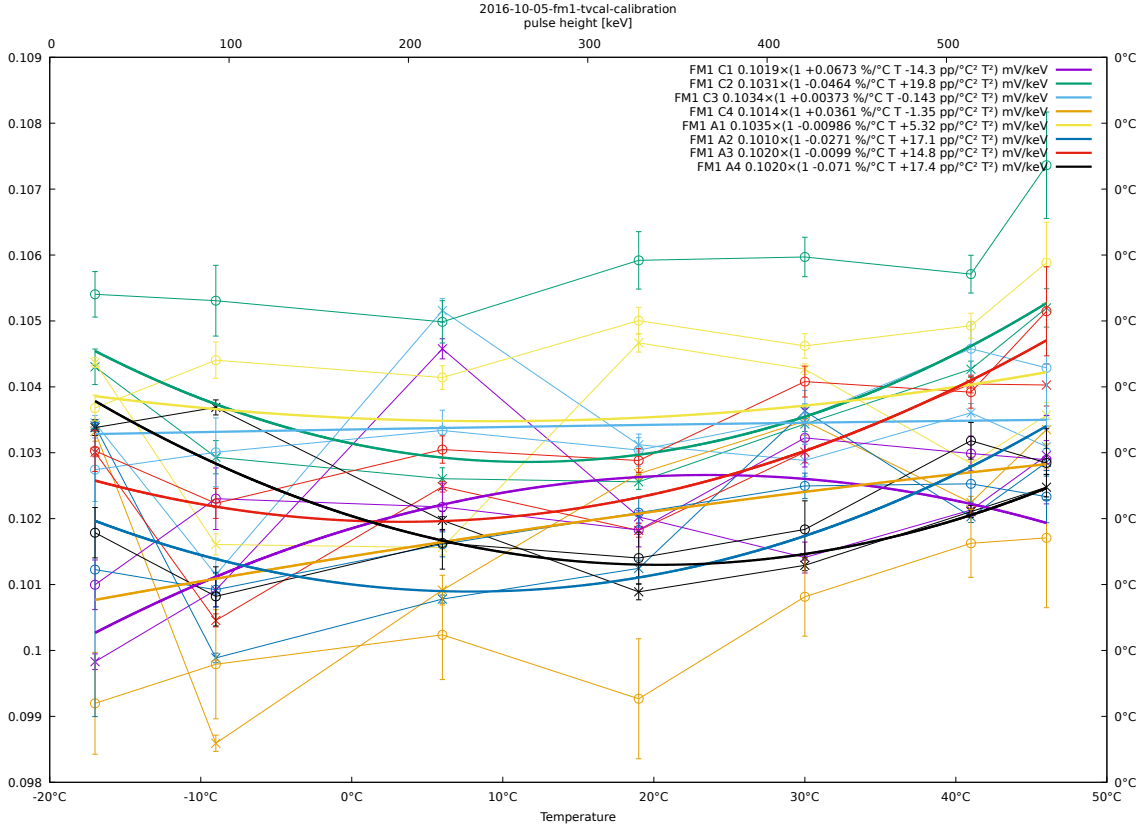

Figure 4: FM1 EPT channel calibration versus temperature fits.

```
FM1_C1_ax_1  =    20.6854; FM1_C1_ax_err_1  =   0.598123 # -17 °C 1
FM1_C1_ex_1  =  0.0998296; FM1_C1_ex_err_1  = 0.000118248 # -17 °C 1
FM1_C1_sx_1  =   0.278013; FM1_C1_sx_err_1  = 0.00743099 # -17 °C 1
FM1_C1_ba_1  =    287.042; FM1_C1_ba_err_1  =    4.54856 # -17 °C 1
FM1_C1_bs_1  =    8.24689; FM1_C1_bs_err_1  =   0.381411 # -17 °C 1
FM1_C1_bca_1 =    22.2573; FM1_C1_bca_err_1 =   0.793088 # -17 °C 1
FM1_C1_bcs_1 =     18.999; FM1_C1_bcs_err_1 =    1.12095 # -17 °C 1
FM1_C1_ac_1  =    25.3387; FM1_C1_ac_err_1  =    1.77736 # -17 °C 1
FM1_C1_ec_1  =   0.100997; FM1_C1_ec_err_1  = 0.000376188 # -17 °C 1
FM1_C1_sc_1  =   0.688061; FM1_C1_sc_err_1  =   0.284948 # -17 °C 1
```

The $\mathtt{e_x}$ and $\mathtt{e_c}$ parameters directly provide the desired calibration, in units mV/keV. The parameter $\mathtt{s_x}$ provides the width σ_x of the x-ray peaks

$$\sigma_x = \frac{\mathtt{s_x}}{\mathtt{e_x}}. \tag{11}$$

The calibration results seem to have large random uncertainties. To further reduce these uncertainties, the calibration factors were fitted to a polynom of

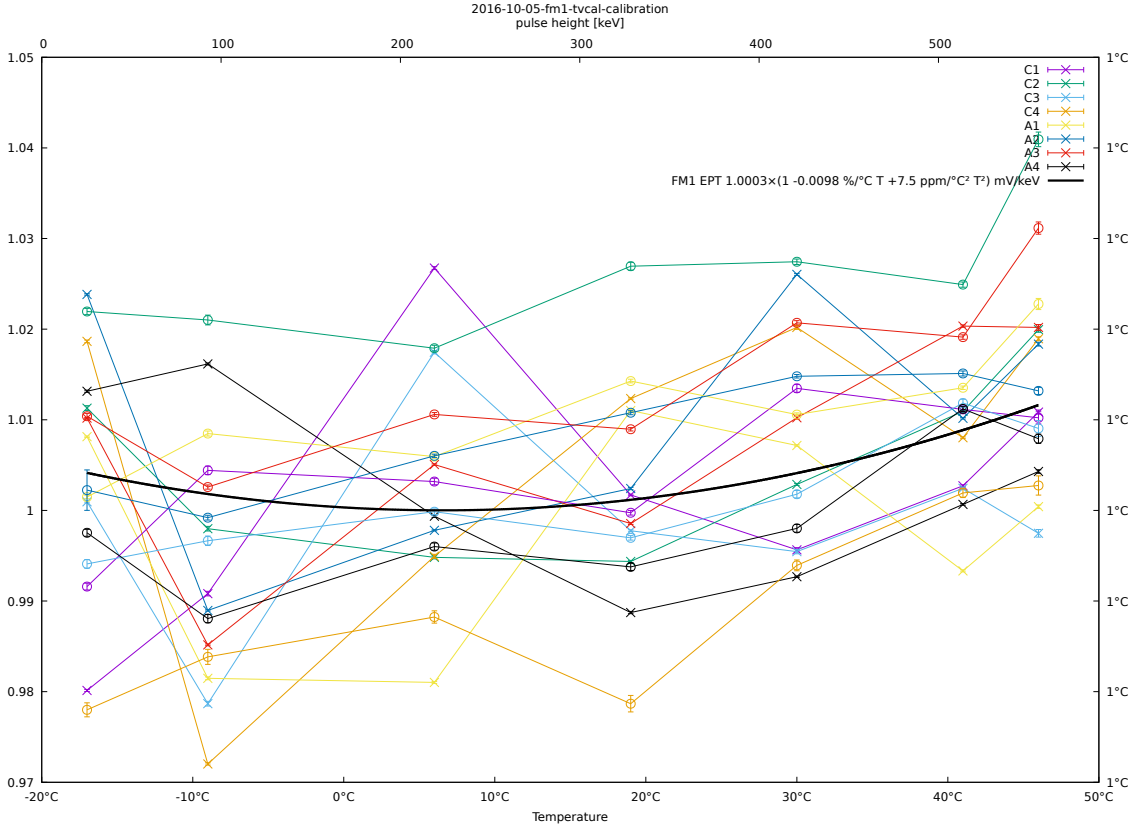

Figure 5: FM1 EPT global calibration versus temperature fit.

degree 2 in the temperature T. Figure 4 shows the fits of each EPT channel, including both the x-ray and Compton factors. Figure 5 shows a global fit of all channels.

For the final calibration of EPT we take the value of the fit function at $T = 0\,^{\circ}\mathrm{C}$ for each channel, and multiply the temperature depended factor from the global fit. The L3-trigger needs to convert from A-scale to keV, so we need to provide the inverse of our calibration parameters scaled back to the A-scale

$$\mathrm{calib} = \frac{1}{9.772 \times \mathrm{e}}. \tag{12}$$

The calibration file section for FM1 EPT is

```
FM1_EPT_TC = 1.0 / (1 + T_HET1*(-9.756e-05 +7.456e-06*T_HET1))
FM1_C1_calib = 1.005 * FM1_EPT_TC
FM1_C2_calib = 0.992 * FM1_EPT_TC
FM1_C3_calib = 0.990 * FM1_EPT_TC
```

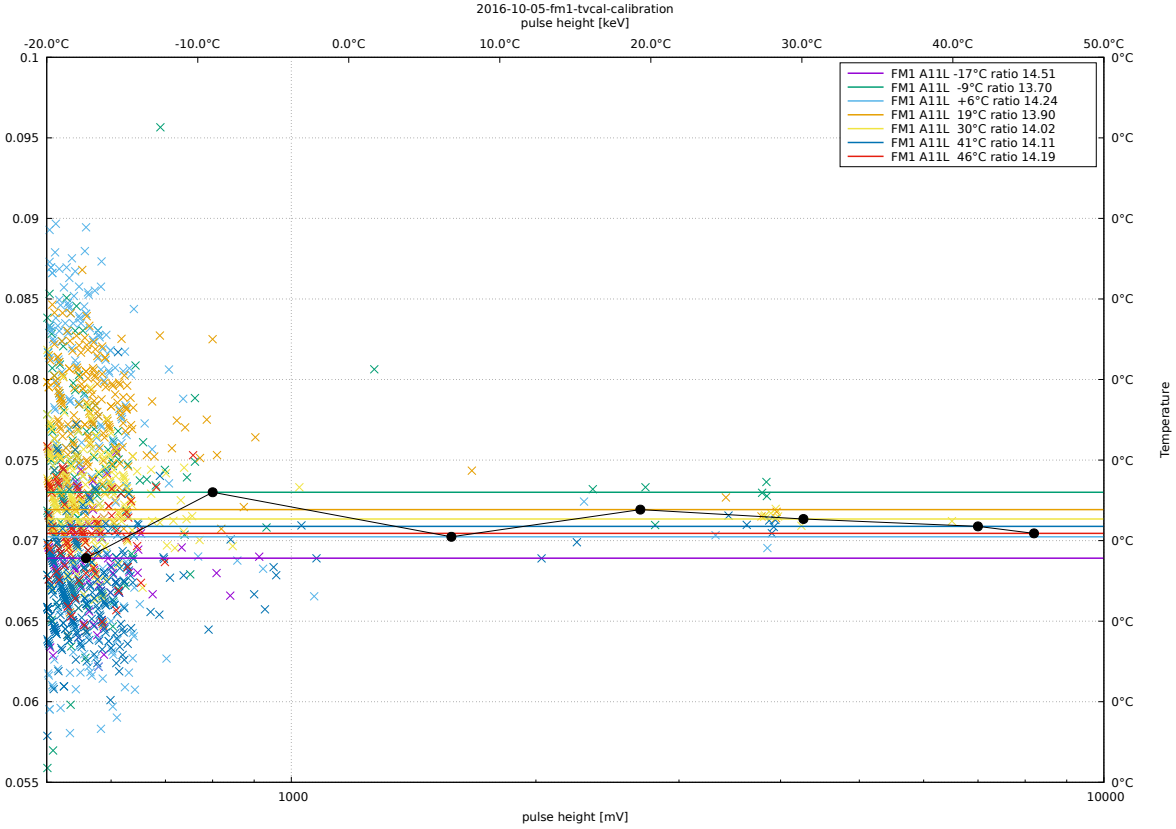

Figure 6: FM1 HET channel A11 high to low gain ratio.

```
FM1_C4_calib = 1.009 * FM1_EPT_TC
FM1_A1_calib = 0.988 * FM1_EPT_TC
FM1_A2_calib = 1.013 * FM1_EPT_TC
FM1_A3_calib = 1.004 * FM1_EPT_TC
FM1_A4_calib = 1.003 * FM1_EPT_TC

FM2_EPT_TC = 1.0 / (1 + T_HET1*(0.0001453 +5.111e-06*T_HET1))
FM2_C1_calib = 0.990 * FM2_EPT_TC
FM2_C2_calib = 1.006 * FM2_EPT_TC
FM2_C3_calib = 0.978 * FM2_EPT_TC
FM2_C4_calib = 0.984 * FM2_EPT_TC
FM2_A1_calib = 1.037 * FM2_EPT_TC
FM2_A2_calib = 0.997 * FM2_EPT_TC
FM2_A3_calib = 0.998 * FM2_EPT_TC
FM2_A4_calib = 0.997 * FM2_EPT_TC
```

The variable `T_HET1` will be initialized to the temperature expected on the BGO detector in the phase of the orbit where the resulting unit configuration

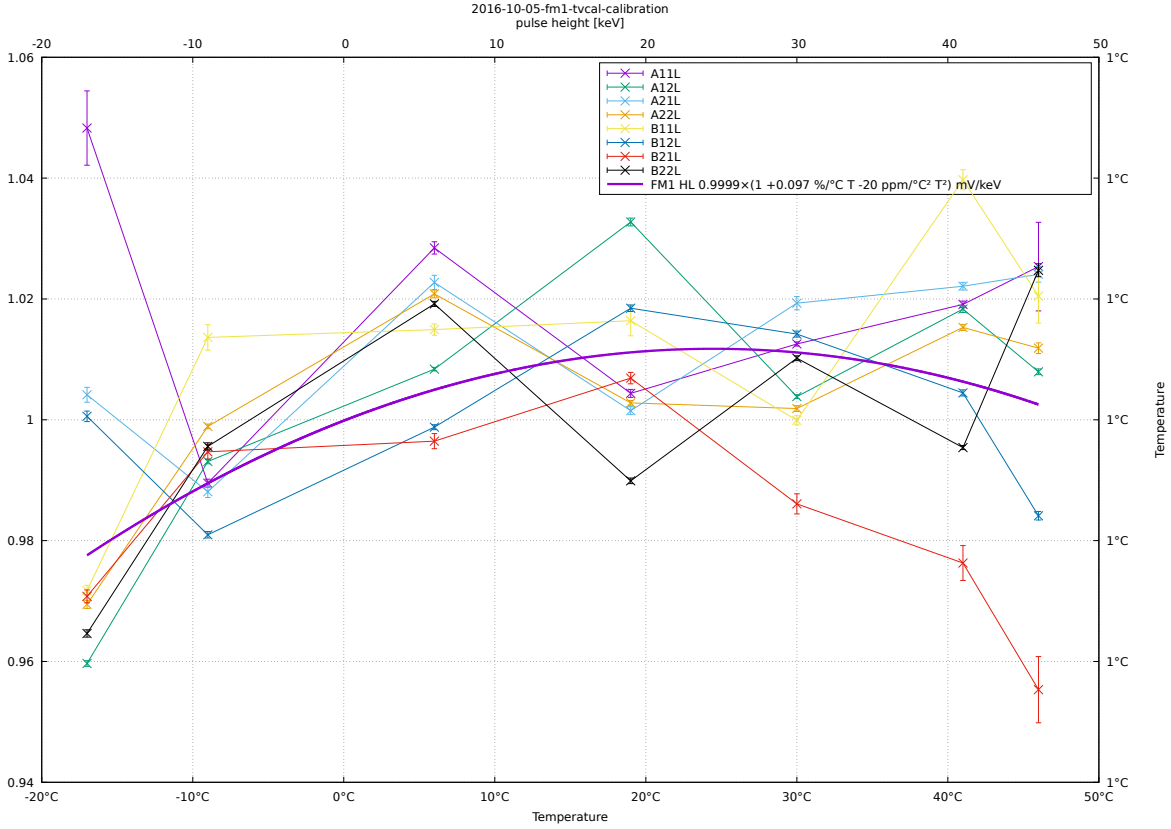

Figure 7: FM1 HET channel high to low gain ratio temperature coefficient.

shall be used.

2.4 HET calibration of the SSD

The calibration of the high gain channels of the HET SSD detectors was done very similar to the EPT calibration. The results are:

```
FM1_HET_HG_TC = 1.0 / (1 + T_HET1*(0.0008845 -1.236e-05*T_HET1))
FM1_A11H_calib = 1.343 * FM1_HET_HG_TC
FM1_A12H_calib = 1.330 * FM1_HET_HG_TC
FM1_A21H_calib = 1.329 * FM1_HET_HG_TC
FM1_A22H_calib = 1.366 * FM1_HET_HG_TC
FM1_B11H_calib = 1.299 * FM1_HET_HG_TC
FM1_B12H_calib = 1.336 * FM1_HET_HG_TC
FM1_B3_TC = 1.0 / (1+0.0001472*T_HET1)
FM1_B13G_calib = 1.132 * FM1_B3_TC
FM1_B23G_calib = 1.170 * FM1_B3_TC
```

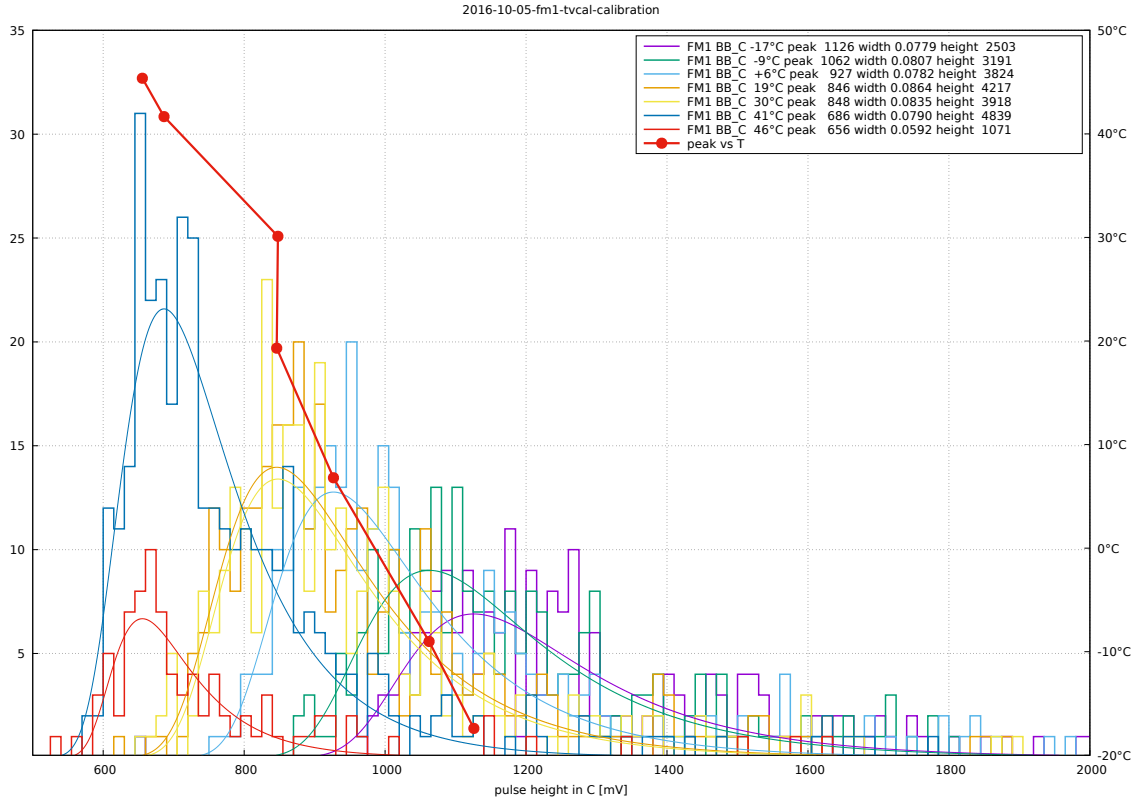

Figure 8: FM1 HET BGO landau fits of B1–B2 coincidence spectra.

```
FM2_HET_HG_TC = 1.0 / (1 + T_HET1*(0.0006021 -3.981e-06*T_HET1))
FM2_A11H_calib = 1.349 * FM2_HET_HG_TC
FM2_A12H_calib = 1.329 * FM2_HET_HG_TC
FM2_A21H_calib = 1.493 * FM2_HET_HG_TC
FM2_A22H_calib = 1.344 * FM2_HET_HG_TC
FM2_B11H_calib = 1.304 * FM2_HET_HG_TC
FM2_B12H_calib = 1.406 * FM2_HET_HG_TC
FM2_B3_TC = 1.0 / (1+0.0001075*T_HET1)
FM2_B13G_calib = 1.125 * FM2_B3_TC
FM2_B23G_calib = 1.173 * FM2_B3_TC
```

The detectors B21 and B22 were not sufficiently illuminated by the source during thermal vacuum testing, no fits could be obtained. For those channels we use a room temperature calibration and apply the common temperature dependence.

```
FM1_B21H_calib2 = 1.290 # HET compton pos 1
```

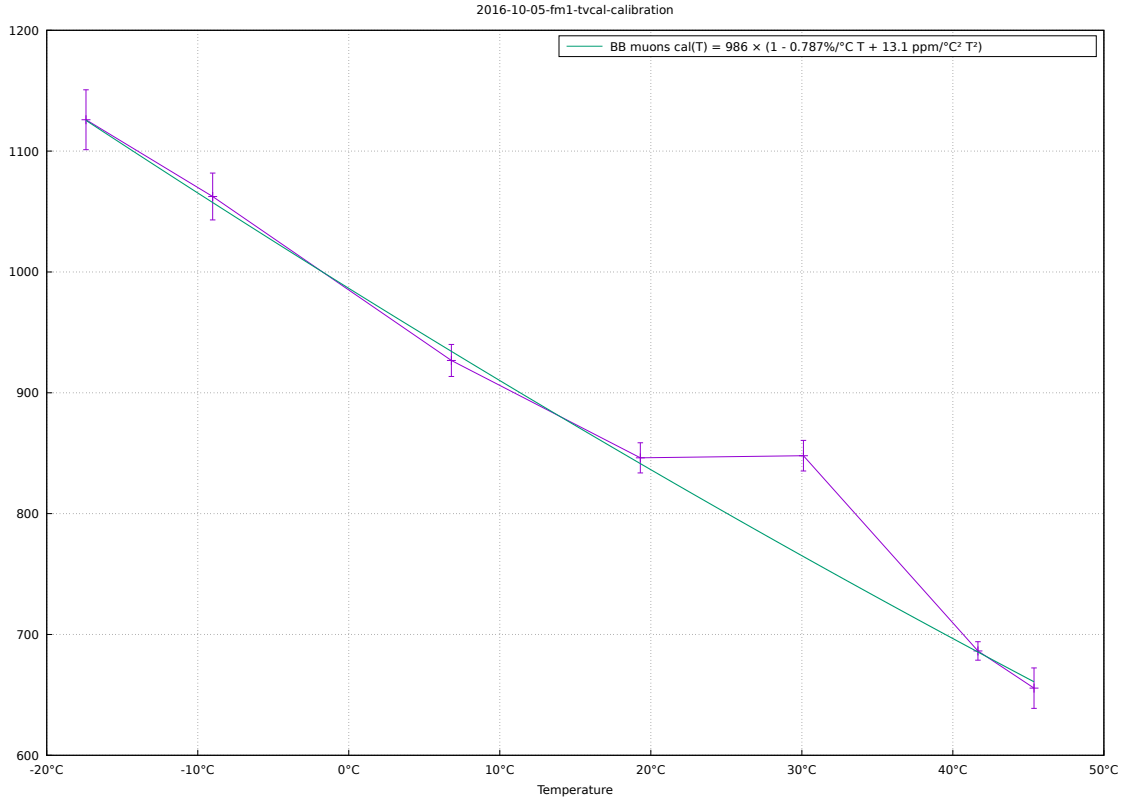

Figure 9: FM1 HET BGO B1–B2 coincidence temperature dependence.

```
FM1_B22H_calib2 = 1.291 # HET compton pos 1

FM2_B21H_calib2 = 1.314 # HET compton pos 1
FM2_B22H_calib2 = 1.316 # HET compton pos 1
```

2.4.1 HET Low Gain

The calibration of the low gain channels is obtained from the weighted mean of the high to low gain ratio using signals with at least 500 mV in the high gain. Figure 6. Individual fits for each channel were used to obtain a ratio at 0 °C. A common fit for all SSD channels yields a temperature dependence model, Figure 7. The calibration file section is

```
FM1_HET_HL_TC = 1.0 / (1 + T_HET1*(0.0009727 -1.988e-05*T_HET1))
FM1_A11L_calib = FM1_A11H_calib * 13.843 * FM1_HET_HL_TC
FM1_A12L_calib = FM1_A12H_calib * 13.797 * FM1_HET_HL_TC
FM1_A21L_calib = FM1_A21H_calib * 13.655 * FM1_HET_HL_TC
```

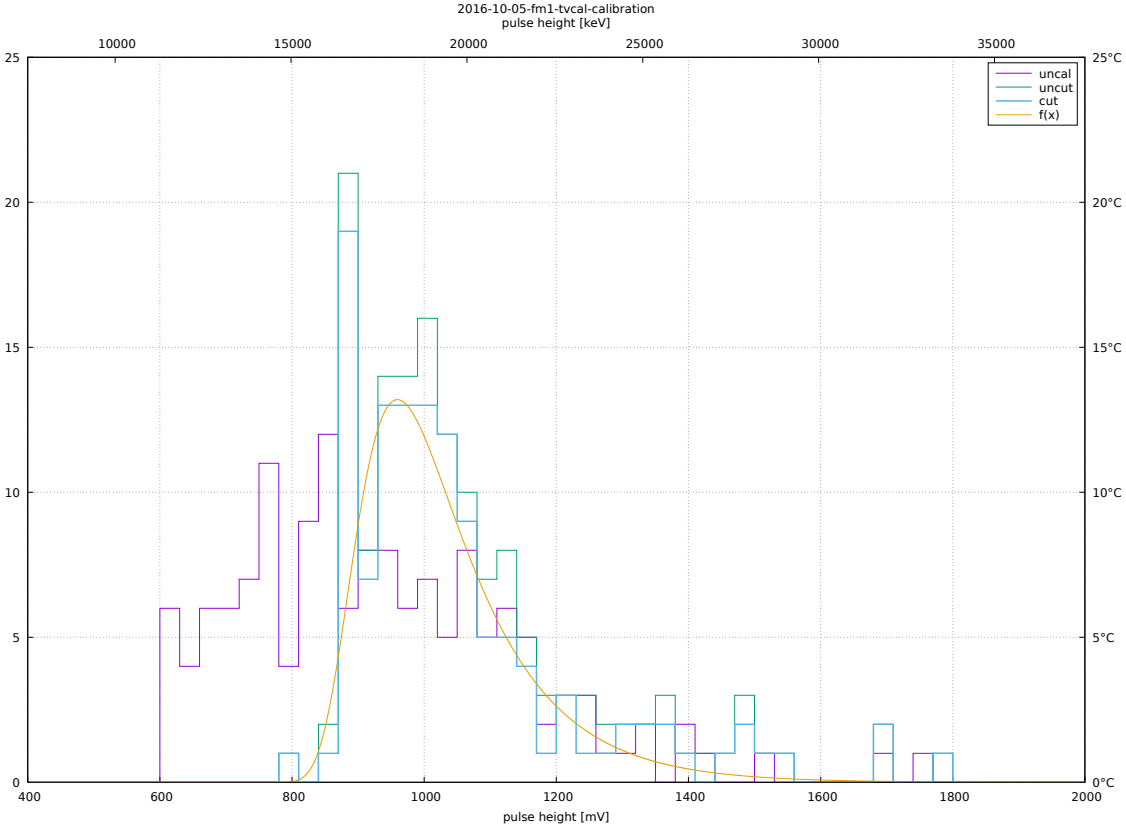

Figure 10: FM1 HET BGO landau fit of the 0 °C A1–B1–B2–A2 coincidence spectrum.

```
FM1_A22L_calib = FM1_A22H_calib * 13.832 * FM1_HET_HL_TC
FM1_B11L_calib = FM1_B11H_calib * 13.866 * FM1_HET_HL_TC
FM1_B12L_calib = FM1_B12H_calib * 13.852 * FM1_HET_HL_TC
FM1_B21L_calib = FM1_B21H_calib * 14.236 * FM1_HET_HL_TC
FM1_B22L_calib = FM1_B22H_calib * 13.804 * FM1_HET_HL_TC

FM2_HET_HL_TC = 1.0 / (1 + T_HET1*(0.0003531 -8.021e-06*T_HET1))
FM2_A11L_calib = FM2_A11H_calib * 13.890 * FM2_HET_HL_TC
FM2_A12L_calib = FM2_A12H_calib * 13.782 * FM2_HET_HL_TC
FM2_A21L_calib = FM2_A21H_calib * 12.763 * FM2_HET_HL_TC
FM2_A22L_calib = FM2_A22H_calib * 13.485 * FM2_HET_HL_TC
FM2_B11L_calib = FM2_B11H_calib * 14.157 * FM2_HET_HL_TC
FM2_B12L_calib = FM2_B12H_calib * 13.466 * FM2_HET_HL_TC
FM2_B21L_calib = FM2_B21H_calib * 13.908 * FM2_HET_HL_TC
FM2_B22L_calib = FM2_B22H_calib * 13.874 * FM2_HET_HL_TC
```

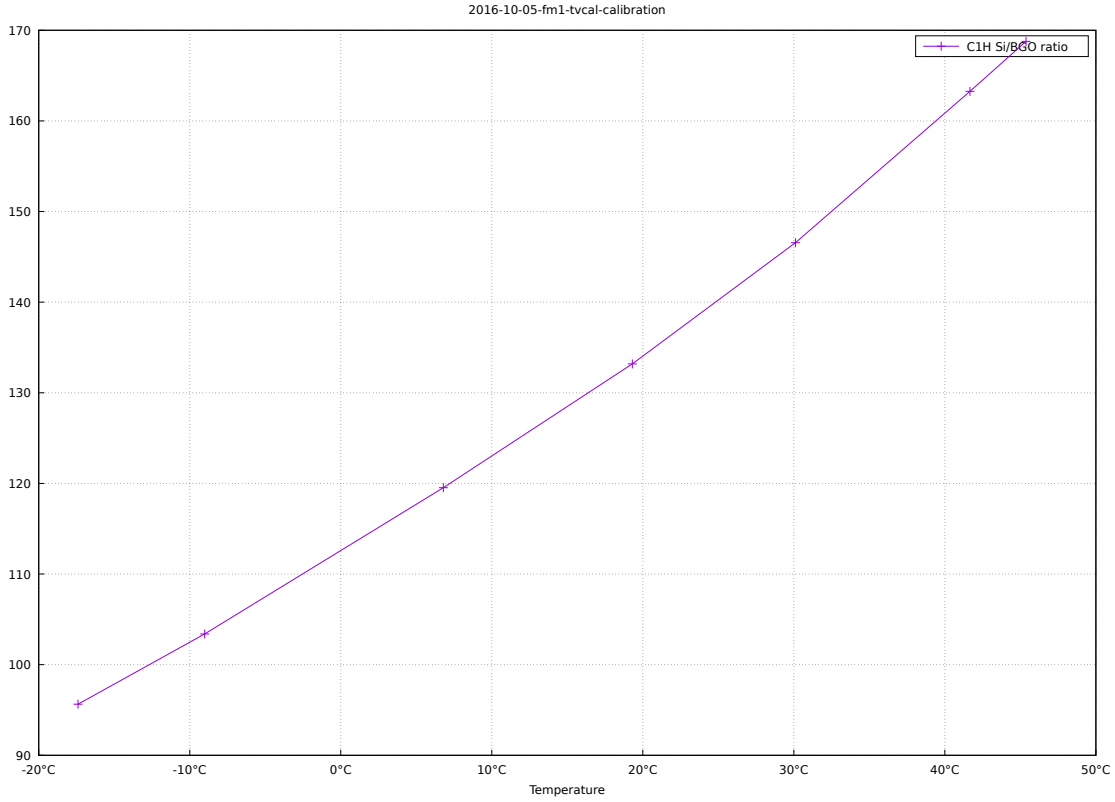

Figure 11: FM1 HET C1H silocon hit to light ratio.

2.5 HET calibration of the BGO

The light yield of the BGO scintillator varies by a factor two over the calibration temperature range. The calibration involved two steps. The temperature dependence was obtained from muon signals with a B1–B2 coincidence, with a landau model fit to the spectra of the sum of C1H and C2H for each temperature, Figure 8.

The function f_{MIPS} to model the landau distribution from muon hits is

$$\begin{aligned} f_{\mathrm{MIPS}}(\mathtt{a},\mathtt{e},\mathtt{s},\ x) &= \mathtt{a}\, f_{\mathrm{Landau}}\left(\frac{x-\mathtt{e}}{\mathtt{s}}\right) \\ f_{\mathrm{Landau}}(x) &= \sqrt{\frac{\exp(-x-\exp(-x))}{2\pi}} \end{aligned} \tag{13}$$

The B1–B2 temperature curve was used to intercalibrate the muons hits triggered in A1–B1–B2–A2 coincidence and calibrate all hits to a 0 °C value.

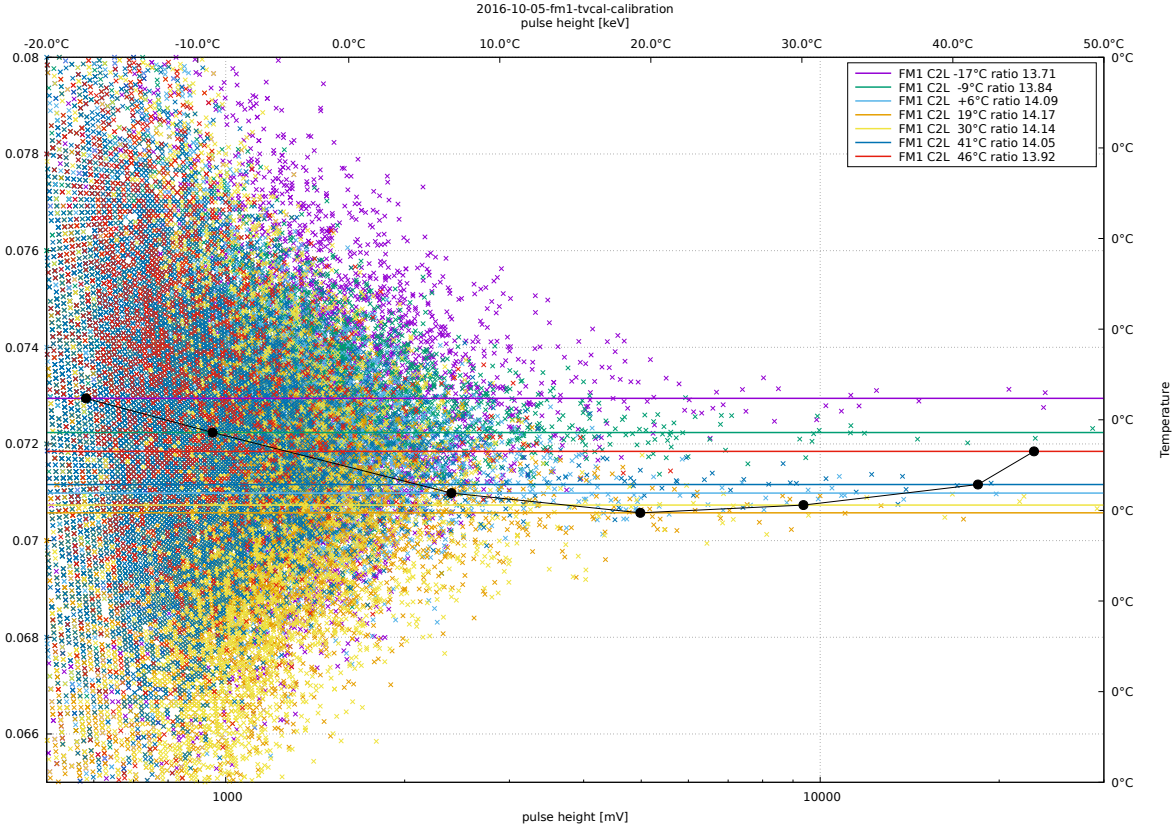

Figure 12: FM1 HET C2L low gain to high gain ratio.

The fit of the resulting spectrum was compared to a Monte Carlo spectrum with the same trigger condition to obtain an absolute energy calibartion at 0 °C. The fit of f_{MIPS} to a Geant4 Monte Carlo muon spectrum predicts the peak position at $\mathsf{e} = 18.024\,\mathrm{MeV}$.

Silicon hits are signals from particle hitting the photodiodes that read out the BGO light. The solicon hit calibration of the C1H channel was obtained in the same way as the SSD calibrations. The second diode C2H was shielded from the source by the BGO crystal. Fig. 11 show the radio of the silicon hit to light calibration. (This is not used for inflight data processing.)

Finally, the high gain to low gain ratio was obtained as for the SSD channels. Figures 12 and 13. The calibration file sections are:

```
FM1_C1H_SiH_calib = 0.168 / (1+T_HET1*(0.001139 -2.152e-05*T_HET1))
FM1_BGO_calib = 18.785 / (1 - T_HET1*(0.007869 -1.31e-05*T_HET1))
FM1_BGO_L_calib = FM1_BGO_calib * 13.927 * (1 + T_HET1*(0.000915 -1.823e-05*T_HET1))
```

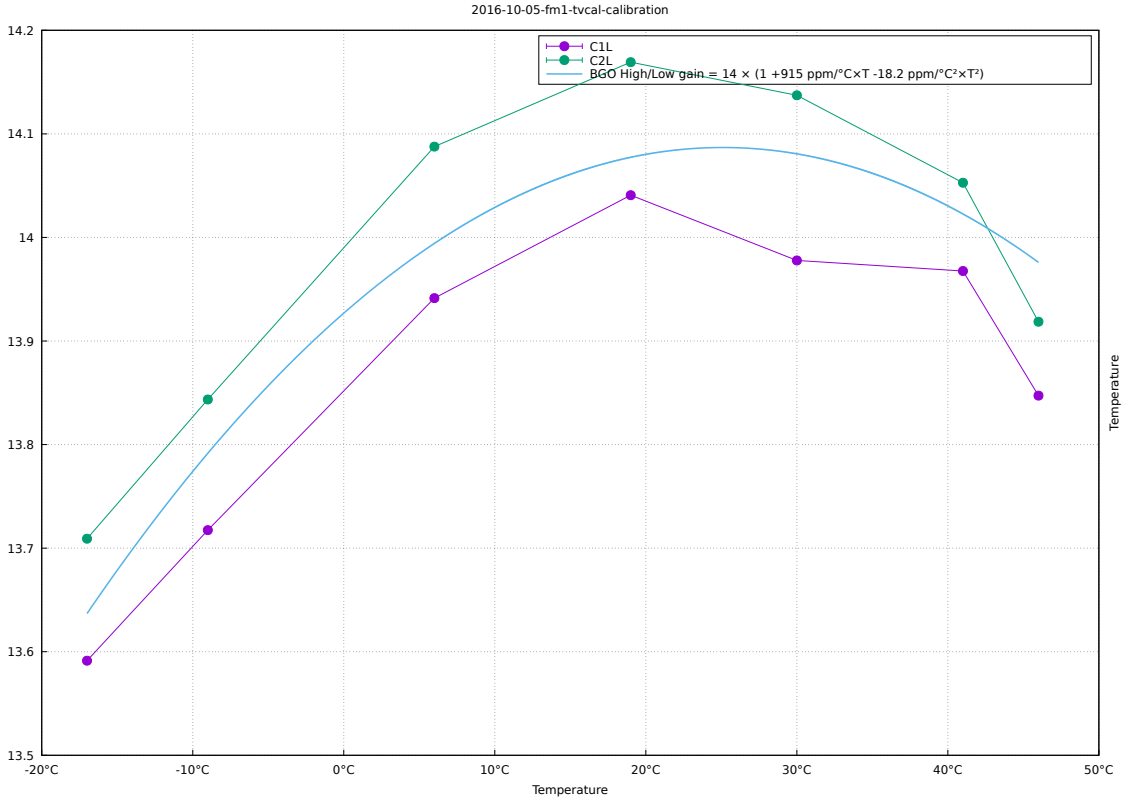

Figure 13: FM1 HET BGA high gain to low gain ratio temperature dependence.

```
FM2_C1H_SiH_calib = 0.166 / (1+T_HET1*(0.000907 -1.598e-05*T_HET1))
FM2_BGO_calib = 17.404 / (1 - T_HET1*(0.007486 +3.396e-05*T_HET1))
FM2_BGO_L_calib = FM2_BGO_calib * 13.854 * (1 + T_HET1*(0.0008645 -1.927e-05*T_HET1))
```

We use the same calibration for C1 and C2, since only the sum is used as a measure of the deposited energy in BGO.

3 Gnuplot Scripts and Results

3.1 FM1 calibration

```
FM1_EPT_TC = 1.0 / (1 + T_HET1*(-9.756e-05 +7.456e-06*T_HET1))
FM1_C1_calib = 1.005 * FM1_EPT_TC
FM1_C2_calib = 0.992 * FM1_EPT_TC
FM1_C3_calib = 0.990 * FM1_EPT_TC
FM1_C4_calib = 1.009 * FM1_EPT_TC
FM1_A1_calib = 0.988 * FM1_EPT_TC
FM1_A2_calib = 1.013 * FM1_EPT_TC
FM1_A3_calib = 1.004 * FM1_EPT_TC
FM1_A4_calib = 1.003 * FM1_EPT_TC
FM1_C1H_SiH_calib = 0.168 / (1+T_HET1*(0.001139 -2.152e-05*T_HET1))
FM1_BGO_calib = 18.785 / (1 - T_HET1*(0.007869 -1.31e-05*T_HET1))
FM1_BGO_L_calib = FM1_BGO_calib * 13.927 * (1 + T_HET1*(0.000915 -1.823e-05*T_HET1))
FM1_HET_HG_TC = 1.0 / (1 + T_HET1*(0.0008845 -1.236e-05*T_HET1))
FM1_A11H_calib = 1.343 * FM1_HET_HG_TC
FM1_A12H_calib = 1.330 * FM1_HET_HG_TC
FM1_A21H_calib = 1.329 * FM1_HET_HG_TC
FM1_A22H_calib = 1.366 * FM1_HET_HG_TC
FM1_B11H_calib = 1.299 * FM1_HET_HG_TC
FM1_B12H_calib = 1.336 * FM1_HET_HG_TC
FM1_B3_TC = 1.0 / (1+0.0001472*T_HET1)
FM1_B13G_calib = 1.132 * FM1_B3_TC
FM1_B23G_calib = 1.170 * FM1_B3_TC
FM1_HET_HL_TC = 1.0 / (1 + T_HET1*(0.0009727 -1.988e-05*T_HET1))
FM1_A11L_calib = FM1_A11H_calib * 13.843 * FM1_HET_HL_TC
FM1_A12L_calib = FM1_A12H_calib * 13.797 * FM1_HET_HL_TC
FM1_A21L_calib = FM1_A21H_calib * 13.655 * FM1_HET_HL_TC
FM1_A22L_calib = FM1_A22H_calib * 13.832 * FM1_HET_HL_TC
FM1_B11L_calib = FM1_B11H_calib * 13.866 * FM1_HET_HL_TC
FM1_B12L_calib = FM1_B12H_calib * 13.852 * FM1_HET_HL_TC
FM1_B21L_calib = FM1_B21H_calib * 14.236 * FM1_HET_HL_TC
FM1_B22L_calib = FM1_B22H_calib * 13.804 * FM1_HET_HL_TC
```

3.2 FM2 calibration

```
FM2_EPT_TC = 1.0 / (1 + T_HET1*(0.0001453 +5.111e-06*T_HET1))
FM2_C1_calib = 0.990 * FM2_EPT_TC
FM2_C2_calib = 1.006 * FM2_EPT_TC
FM2_C3_calib = 0.978 * FM2_EPT_TC
FM2_C4_calib = 0.984 * FM2_EPT_TC
FM2_A1_calib = 1.037 * FM2_EPT_TC
FM2_A2_calib = 0.997 * FM2_EPT_TC
FM2_A3_calib = 0.998 * FM2_EPT_TC
FM2_A4_calib = 0.997 * FM2_EPT_TC
FM2_C1H_SiH_calib = 0.166 / (1+T_HET1*(0.000907 -1.598e-05*T_HET1))
FM2_BGO_calib = 17.404 / (1 - T_HET1*(0.007486 +3.396e-05*T_HET1))
FM2_BGO_L_calib = FM2_BGO_calib * 13.854 * (1 + T_HET1*(0.0008645 -1.927e-05*T_HET1))
FM2_HET_HG_TC = 1.0 / (1 + T_HET1*(0.0006021 -3.981e-06*T_HET1))
FM2_A11H_calib = 1.349 * FM2_HET_HG_TC
FM2_A12H_calib = 1.329 * FM2_HET_HG_TC
FM2_A21H_calib = 1.493 * FM2_HET_HG_TC
FM2_A22H_calib = 1.344 * FM2_HET_HG_TC
FM2_B11H_calib = 1.304 * FM2_HET_HG_TC
FM2_B12H_calib = 1.406 * FM2_HET_HG_TC
FM2_B3_TC = 1.0 / (1+0.0001075*T_HET1)
FM2_B13G_calib = 1.125 * FM2_B3_TC
FM2_B23G_calib = 1.173 * FM2_B3_TC
FM2_HET_HL_TC = 1.0 / (1 + T_HET1*(0.0003531 -8.021e-06*T_HET1))
FM2_A11L_calib = FM2_A11H_calib * 13.890 * FM2_HET_HL_TC
FM2_A12L_calib = FM2_A12H_calib * 13.782 * FM2_HET_HL_TC
FM2_A21L_calib = FM2_A21H_calib * 12.763 * FM2_HET_HL_TC
FM2_A22L_calib = FM2_A22H_calib * 13.485 * FM2_HET_HL_TC
FM2_B11L_calib = FM2_B11H_calib * 14.157 * FM2_HET_HL_TC
FM2_B12L_calib = FM2_B12H_calib * 13.466 * FM2_HET_HL_TC
FM2_B21L_calib = FM2_B21H_calib * 13.908 * FM2_HET_HL_TC
FM2_B22L_calib = FM2_B22H_calib * 13.874 * FM2_HET_HL_TC
```

3.3 FM room temperature calibration

```
FM1_C1_calib2 = 0.999 # EPT compton pos 2
FM2_C1_calib2 = 0.971 # EPT compton pos 2
FM1_C2_calib2 = 0.963 # EPT compton pos 2
FM2_C2_calib2 = 0.993 # EPT compton pos 2
FM1_C3_calib2 = 0.989 # EPT compton pos 2
FM2_C3_calib2 = 0.978 # EPT compton pos 2
FM1_C4_calib2 = 1.000 # EPT compton pos 2
FM2_C4_calib2 = 0.983 # EPT compton pos 2
FM1_A1_calib2 = 0.982 # EPT compton pos 2
FM2_A1_calib2 = 1.030 # EPT compton pos 2
FM1_A2_calib2 = 1.000 # EPT compton pos 2
FM2_A2_calib2 = 0.975 # EPT compton pos 2
FM1_A3_calib2 = 0.985 # EPT compton pos 2
FM2_A3_calib2 = 0.994 # EPT compton pos 2
FM1_A4_calib2 = 0.989 # EPT compton pos 2
FM2_A4_calib2 = 0.980 # EPT compton pos 2
FM1_A11H_calib2 = 1.319 # HET compton pos 2
FM2_A11H_calib2 = 1.328 # HET compton pos 2
FM1_A12H_calib2 = 1.312 # HET compton pos 2
FM2_A12H_calib2 = 1.339 # HET compton pos 2
FM1_A21H_calib2 = 1.316 # HET compton pos 1
FM2_A21H_calib2 = 1.404 # HET compton pos 2
FM1_A22H_calib2 = 1.314 # HET compton pos 1
FM2_A22H_calib2 = 1.344 # HET compton pos 1
FM1_B11H_calib2 = 1.290 # HET compton pos 1
FM2_B11H_calib2 = 1.301 # HET compton pos 1
FM1_B12H_calib2 = 1.289 # HET compton pos 1
FM2_B12H_calib2 = 1.315 # HET compton pos 1
FM1_B21H_calib2 = 1.290 # HET compton pos 1
FM2_B21H_calib2 = 1.314 # HET compton pos 1
FM1_B22H_calib2 = 1.291 # HET compton pos 1
FM2_B22H_calib2 = 1.316 # HET compton pos 1
```

3.4 FM1 results

```
# Mi 19. Okt 11:42:26 CEST 2016
FM1_C1_ax_1  =     20.6854; FM1_C1_ax_err_1  =    0.598123 # -17 °C 1
FM1_C1_ex_1  =   0.0998296; FM1_C1_ex_err_1  = 0.000118248 # -17 °C 1
FM1_C1_sx_1  =    0.278013; FM1_C1_sx_err_1  = 0.00743099 # -17 °C 1
FM1_C1_ba_1  =     287.042; FM1_C1_ba_err_1  =     4.54856 # -17 °C 1
FM1_C1_bs_1  =     8.24689; FM1_C1_bs_err_1  =    0.381411 # -17 °C 1
FM1_C1_ax_2  =     13.8201; FM1_C1_ax_err_2  =    0.452549 # -9 °C 1
FM1_C1_ex_2  =    0.100918; FM1_C1_ex_err_2  = 0.000251729 # -9 °C 1
FM1_C1_sx_2  =    0.515754; FM1_C1_sx_err_2  =   0.0185688 # -9 °C 1
FM1_C1_ba_2  =     360.408; FM1_C1_ba_err_2  =     5.29058 # -9 °C 1
FM1_C1_bs_2  =     7.23603; FM1_C1_bs_err_2  =    0.263556 # -9 °C 1
FM1_C1_ax_3  =      23.001; FM1_C1_ax_err_3  =    0.603796 # +6 °C 1
FM1_C1_ex_3  =    0.104577; FM1_C1_ex_err_3  = 0.000152379 # +6 °C 1
FM1_C1_sx_3  =    0.388872; FM1_C1_sx_err_3  =   0.0100593 # +6 °C 1
FM1_C1_ba_3  =     456.471; FM1_C1_ba_err_3  =     5.77503 # +6 °C 1
FM1_C1_bs_3  =     6.62864; FM1_C1_bs_err_3  =    0.190987 # +6 °C 1
FM1_C1_ax_4  =     33.3848; FM1_C1_ax_err_4  =    0.745222 # 19 °C 1
FM1_C1_ex_4  =    0.102027; FM1_C1_ex_err_4  =  9.221e-05 # 19 °C 1
FM1_C1_sx_4  =    0.275646; FM1_C1_sx_err_4  = 0.00581732 # 19 °C 1
FM1_C1_ba_4  =     445.027; FM1_C1_ba_err_4  =      5.5618 # 19 °C 1
FM1_C1_bs_4  =     7.82904; FM1_C1_bs_err_4  =    0.270048 # 19 °C 1
FM1_C1_ax_5  =      17.244; FM1_C1_ax_err_5  =    0.492736 # 30 °C 1
FM1_C1_ex_5  =     0.10141; FM1_C1_ex_err_5  = 0.000234525 # 30 °C 1
FM1_C1_sx_5  =    0.555068; FM1_C1_sx_err_5  =   0.0179591 # 30 °C 1
FM1_C1_ba_5  =     472.866; FM1_C1_ba_err_5  =     6.21106 # 30 °C 1
FM1_C1_bs_5  =     6.62795; FM1_C1_bs_err_5  =    0.194854 # 30 °C 1
FM1_C1_ax_6  =      34.706; FM1_C1_ax_err_6  =    0.753134 # 41 °C 1
FM1_C1_ex_6  =     0.10213; FM1_C1_ex_err_6  = 0.000101822 # 41 °C 1
FM1_C1_sx_6  =    0.316029; FM1_C1_sx_err_6  = 0.00648602 # 41 °C 1
FM1_C1_ba_6  =     551.476; FM1_C1_ba_err_6  =     6.19433 # 41 °C 1
FM1_C1_bs_6  =     7.46971; FM1_C1_bs_err_6  =    0.220591 # 41 °C 1
FM1_C1_ax_7  =     8.12743; FM1_C1_ax_err_7  =    0.371614 # 46 °C 1
FM1_C1_ex_7  =    0.102958; FM1_C1_ex_err_7  = 0.000225254 # 46 °C 1
FM1_C1_sx_7  =    0.329064; FM1_C1_sx_err_7  =   0.0143656 # 46 °C 1
FM1_C1_ba_7  =     141.387; FM1_C1_ba_err_7  =     4.36913 # 46 °C 1
FM1_C1_bs_7  =     9.02772; FM1_C1_bs_err_7  =    0.917589 # 46 °C 1
FM1_C2_ax_1  =     11.7995; FM1_C2_ax_err_1  =    0.398761 # -17 °C 2
FM1_C2_ex_1  =    0.104304; FM1_C2_ex_err_1  = 0.000269369 # -17 °C 2
FM1_C2_sx_1  =    0.540704; FM1_C2_sx_err_1  =   0.0202491 # -17 °C 2
FM1_C2_ba_1  =     269.614; FM1_C2_ba_err_1  =     4.72222 # -17 °C 2
FM1_C2_bs_1  =     6.93471; FM1_C2_bs_err_1  =    0.282771 # -17 °C 2
FM1_C2_ax_2  =      13.261; FM1_C2_ax_err_2  =    0.434149 # -9 °C 2
FM1_C2_ex_2  =    0.102932; FM1_C2_ex_err_2  = 0.00025226 # -9 °C 2
FM1_C2_sx_2  =    0.534146; FM1_C2_sx_err_2  =   0.0193443 # -9 °C 2
FM1_C2_ba_2  =     326.159; FM1_C2_ba_err_2  =     5.07759 # -9 °C 2
FM1_C2_bs_2  =     7.07906; FM1_C2_bs_err_2  =    0.262689 # -9 °C 2
FM1_C2_ax_3  =     20.9278; FM1_C2_ax_err_3  =    0.571049 # +6 °C 2
FM1_C2_ex_3  =    0.102606; FM1_C2_ex_err_3  = 0.000166139 # +6 °C 2
FM1_C2_sx_3  =    0.417343; FM1_C2_sx_err_3  =   0.0115199 # +6 °C 2
FM1_C2_ba_3  =     425.932; FM1_C2_ba_err_3  =     5.54384 # +6 °C 2
FM1_C2_bs_3  =     7.49173; FM1_C2_bs_err_3  =    0.254046 # +6 °C 2
FM1_C2_ax_4  =     26.8751; FM1_C2_ax_err_4  =    0.663215 # 19 °C 2
FM1_C2_ex_4  =    0.102559; FM1_C2_ex_err_4  = 0.000114161 # 19 °C 2
FM1_C2_sx_4  =    0.314057; FM1_C2_sx_err_4  = 0.00734257 # 19 °C 2
FM1_C2_ba_4  =     425.665; FM1_C2_ba_err_4  =     5.42558 # 19 °C 2
FM1_C2_bs_4  =     8.54435; FM1_C2_bs_err_4  =     0.32453 # 19 °C 2
FM1_C2_ax_5  =     26.9566; FM1_C2_ax_err_5  =    0.651068 # 30 °C 2
FM1_C2_ex_5  =    0.103436; FM1_C2_ex_err_5  = 0.000114221 # 30 °C 2
FM1_C2_sx_5  =    0.319871; FM1_C2_sx_err_5  = 0.00729211 # 30 °C 2
FM1_C2_ba_5  =     401.268; FM1_C2_ba_err_5  =      5.2809 # 30 °C 2
FM1_C2_bs_5  =      8.3803; FM1_C2_bs_err_5  =    0.320646 # 30 °C 2
FM1_C2_ax_6  =     29.7121; FM1_C2_ax_err_6  =    0.670482 # 41 °C 2
FM1_C2_ex_6  =    0.104267; FM1_C2_ex_err_6  = 0.000123073 # 41 °C 2
FM1_C2_sx_6  =    0.364373; FM1_C2_sx_err_6  = 0.00792965 # 41 °C 2
FM1_C2_ba_6  =     498.338; FM1_C2_ba_err_6  =     5.93706 # 41 °C 2
FM1_C2_bs_6  =      7.4731; FM1_C2_bs_err_6  =    0.228409 # 41 °C 2
FM1_C2_ax_7  =     6.73286; FM1_C2_ax_err_7  =    0.325756 # 46 °C 2
FM1_C2_ex_7  =    0.105197; FM1_C2_ex_err_7  = 0.000290544 # 46 °C 2
FM1_C2_sx_7  =    0.400477; FM1_C2_sx_err_7  =   0.0192538 # 46 °C 2
FM1_C2_ba_7  =     123.462; FM1_C2_ba_err_7  =     4.92227 # 46 °C 2
```

```
 71  FM1_C2_bs_7  =     8.28442;  FM1_C2_bs_err_7  =    0.965733 # 46 °C 2
 72  FM1_C3_ax_1  =     22.9508;  FM1_C3_ax_err_1  =    0.664174 # −17 °C 3
 73  FM1_C3_ex_1  =    0.103451;  FM1_C3_ex_err_1  = 0.000114239 # −17 °C 3
 74  FM1_C3_sx_1  =    0.267779;  FM1_C3_sx_err_1  = 0.00751997 # −17 °C 3
 75  FM1_C3_ba_1  =     410.729;  FM1_C3_ba_err_1  =     5.23726 # −17 °C 3
 76  FM1_C3_bs_1  =     7.86477;  FM1_C3_bs_err_1  =    0.277374 # −17 °C 3
 77  FM1_C3_ax_2  =     14.9349;  FM1_C3_ax_err_2  =    0.493199 # −9 °C 3
 78  FM1_C3_ex_2  =    0.101149;  FM1_C3_ex_err_2  = 0.000257481 # −9 °C 3
 79  FM1_C3_sx_2  =    0.535305;  FM1_C3_sx_err_2  =   0.0199861 # −9 °C 3
 80  FM1_C3_ba_2  =     502.864;  FM1_C3_ba_err_2  =     6.26809 # −9 °C 3
 81  FM1_C3_bs_2  =     7.20993;  FM1_C3_bs_err_2  =    0.220013 # −9 °C 3
 82  FM1_C3_ax_3  =     22.8405;  FM1_C3_ax_err_3  =    0.613229 # +6 °C 3
 83  FM1_C3_ex_3  =    0.105157;  FM1_C3_ex_err_3  = 0.000181613 # +6 °C 3
 84  FM1_C3_sx_3  =    0.440633;  FM1_C3_sx_err_3  =   0.0122622 # +6 °C 3
 85  FM1_C3_ba_3  =      631.52;  FM1_C3_ba_err_3  =     6.87611 # +6 °C 3
 86  FM1_C3_bs_3  =     6.93471;  FM1_C3_bs_err_3  =     0.17719 # +6 °C 3
 87  FM1_C3_ax_4  =     31.6234;  FM1_C3_ax_err_4  =    0.766847 # 19 °C 3
 88  FM1_C3_ex_4  =    0.103121;  FM1_C3_ex_err_4  =   0.0001085 # 19 °C 3
 89  FM1_C3_sx_4  =    0.301148;  FM1_C3_sx_err_4  = 0.00704024 # 19 °C 3
 90  FM1_C3_ba_4  =     650.847;  FM1_C3_ba_err_4  =     6.61582 # 19 °C 3
 91  FM1_C3_bs_4  =     7.47741;  FM1_C3_bs_err_4  =     0.20037 # 19 °C 3
 92  FM1_C3_ax_5  =     18.6396;  FM1_C3_ax_err_5  =    0.524128 # 30 °C 3
 93  FM1_C3_ex_5  =    0.102883;  FM1_C3_ex_err_5  = 0.000240933 # 30 °C 3
 94  FM1_C3_sx_5  =    0.578324;  FM1_C3_sx_err_5  =   0.0187495 # 30 °C 3
 95  FM1_C3_ba_5  =     628.162;  FM1_C3_ba_err_5  =     7.19272 # 30 °C 3
 96  FM1_C3_bs_5  =     6.83182;  FM1_C3_bs_err_5  =    0.176438 # 30 °C 3
 97  FM1_C3_ax_6  =     29.7507;  FM1_C3_ax_err_6  =     0.72423 # 41 °C 3
 98  FM1_C3_ex_6  =    0.103605;  FM1_C3_ex_err_6  = 0.000142661 # 41 °C 3
 99  FM1_C3_sx_6  =    0.392152;  FM1_C3_sx_err_6  = 0.00958293 # 41 °C 3
100  FM1_C3_ba_6  =      790.28;  FM1_C3_ba_err_6  =     7.42244 # 41 °C 3
101  FM1_C3_bs_6  =     7.59417;  FM1_C3_bs_err_6  =    0.187231 # 41 °C 3
102  FM1_C3_ax_7  =     5.79059;  FM1_C3_ax_err_7  =    0.309207 # 46 °C 3
103  FM1_C3_ex_7  =    0.103092;  FM1_C3_ex_err_7  = 0.000416058 # 46 °C 3
104  FM1_C3_sx_7  =    0.521208;  FM1_C3_sx_err_7  =    0.031081 # 46 °C 3
105  FM1_C3_ba_7  =     195.688;  FM1_C3_ba_err_7  =     3.94363 # 46 °C 3
106  FM1_C3_bs_7  =     6.68297;  FM1_C3_bs_err_7  =    0.302787 # 46 °C 3
107  FM1_C4_ax_1  =     19.8681;  FM1_C4_ax_err_1  =    0.566584 # −17 °C 4
108  FM1_C4_ex_1  =    0.103322;  FM1_C4_ex_err_1  = 0.000146924 # −17 °C 4
109  FM1_C4_sx_1  =    0.340312;  FM1_C4_sx_err_1  = 0.00934557 # −17 °C 4
110  FM1_C4_ba_1  =     359.279;  FM1_C4_ba_err_1  =     5.00179 # −17 °C 4
111  FM1_C4_bs_1  =     7.67264;  FM1_C4_bs_err_1  =    0.285756 # −17 °C 4
112  FM1_C4_ax_2  =     24.6701;  FM1_C4_ax_err_2  =    0.656319 # −9 °C 4
113  FM1_C4_ex_2  =   0.0985922;  FM1_C4_ex_err_2  = 0.000123278 # −9 °C 4
114  FM1_C4_sx_2  =     0.31351;  FM1_C4_sx_err_2  = 0.00797784 # −9 °C 4
115  FM1_C4_ba_2  =     433.823;  FM1_C4_ba_err_2  =     5.56607 # −9 °C 4
116  FM1_C4_bs_2  =     8.86183;  FM1_C4_bs_err_2  =    0.354107 # −9 °C 4
117  FM1_C4_ax_3  =     19.1916;  FM1_C4_ax_err_3  =    0.534466 # +6 °C 4
118  FM1_C4_ex_3  =    0.100916;  FM1_C4_ex_err_3  = 0.000225278 # +6 °C 4
119  FM1_C4_sx_3  =    0.542034;  FM1_C4_sx_err_3  =   0.0170381 # +6 °C 4
120  FM1_C4_ba_3  =     569.397;  FM1_C4_ba_err_3  =     6.73031 # +6 °C 4
121  FM1_C4_bs_3  =     7.34496;  FM1_C4_bs_err_3  =    0.216048 # +6 °C 4
122  FM1_C4_ax_4  =      40.503;  FM1_C4_ax_err_4  =    0.856667 # 19 °C 4
123  FM1_C4_ex_4  =    0.102682;  FM1_C4_ex_err_4  = 7.92053e−05 # 19 °C 4
124  FM1_C4_sx_4  =    0.255885;  FM1_C4_sx_err_4  = 0.00523612 # 19 °C 4
125  FM1_C4_ba_4  =     539.265;  FM1_C4_ba_err_4  =     6.08154 # 19 °C 4
126  FM1_C4_bs_4  =     8.34285;  FM1_C4_bs_err_4  =    0.277732 # 19 °C 4
127  FM1_C4_ax_5  =     20.2713;  FM1_C4_ax_err_5  =    0.552339 # 30 °C 4
128  FM1_C4_ex_5  =    0.103478;  FM1_C4_ex_err_5  = 0.000212213 # 30 °C 4
129  FM1_C4_sx_5  =    0.520144;  FM1_C4_sx_err_5  =   0.0156432 # 30 °C 4
130  FM1_C4_ba_5  =     574.722;  FM1_C4_ba_err_5  =     6.68488 # 30 °C 4
131  FM1_C4_bs_5  =     7.43443;  FM1_C4_bs_err_5  =    0.216842 # 30 °C 4
132  FM1_C4_ax_6  =     39.3252;  FM1_C4_ax_err_6  =    0.822011 # 41 °C 4
133  FM1_C4_ex_6  =    0.102243;  FM1_C4_ex_err_6  = 9.5603e−05 # 41 °C 4
134  FM1_C4_sx_6  =    0.308957;  FM1_C4_sx_err_6  =   0.0061278 # 41 °C 4
135  FM1_C4_ba_6  =     680.438;  FM1_C4_ba_err_6  =     6.83849 # 41 °C 4
136  FM1_C4_bs_6  =     8.66925;  FM1_C4_bs_err_6  =     0.26667 # 41 °C 4
137  FM1_C4_ax_7  =     9.06326;  FM1_C4_ax_err_7  =    0.389809 # 46 °C 4
138  FM1_C4_ex_7  =    0.103351;  FM1_C4_ex_err_7  = 0.000218398 # 46 °C 4
139  FM1_C4_sx_7  =    0.337698;  FM1_C4_sx_err_7  =   0.0139445 # 46 °C 4
140  FM1_C4_ba_7  =     173.499;  FM1_C4_ba_err_7  =     3.71473 # 46 °C 4
141  FM1_C4_bs_7  =     8.55648;  FM1_C4_bs_err_7  =    0.544132 # 46 °C 4
142  FM1_A1_ax_1  =     55.7684;  FM1_A1_ax_err_1  =     1.00742 # −17 °C 5
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143  FM1_A1_ex_1  =    0.104368; FM1_A1_ex_err_1  = 7.56184e-05 # -17 °C 5
144  FM1_A1_sx_1  =     0.28625; FM1_A1_sx_err_1  = 0.00486439 # -17 °C 5
145  FM1_A1_ba_1  =     936.158; FM1_A1_ba_err_1  =      8.3331 # -17 °C 5
146  FM1_A1_bs_1  =     7.67392; FM1_A1_bs_err_1  =     0.19131 # -17 °C 5
147  FM1_A1_ax_2  =     36.7571; FM1_A1_ax_err_2  =    0.795884 # -9 °C 5
148  FM1_A1_ex_2  =    0.101608; FM1_A1_ex_err_2  = 0.000159289 # -9 °C 5
149  FM1_A1_sx_2  =    0.508458; FM1_A1_sx_err_2  =   0.0121544 # -9 °C 5
150  FM1_A1_ba_2  =     1202.35; FM1_A1_ba_err_2  =     10.0194 # -9 °C 5
151  FM1_A1_bs_2  =     7.31974; FM1_A1_bs_err_2  =    0.158105 # -9 °C 5
152  FM1_A1_ax_3  =     56.4322; FM1_A1_ax_err_3  =      1.0004 # +6 °C 5
153  FM1_A1_ex_3  =    0.101561; FM1_A1_ex_err_3  = 0.000111599 # +6 °C 5
154  FM1_A1_sx_3  =    0.432606; FM1_A1_sx_err_3  = 0.00788398 # +6 °C 5
155  FM1_A1_ba_3  =     1533.59; FM1_A1_ba_err_3  =     11.0106 # +6 °C 5
156  FM1_A1_bs_3  =      7.3505; FM1_A1_bs_err_3  =    0.139493 # +6 °C 5
157  FM1_A1_ax_4  =      50.065; FM1_A1_ax_err_4  =    0.881234 # 19 °C 5
158  FM1_A1_ex_4  =    0.104667; FM1_A1_ex_err_4  = 0.000139798 # 19 °C 5
159  FM1_A1_sx_4  =    0.528569; FM1_A1_sx_err_4  =   0.0103205 # 19 °C 5
160  FM1_A1_ba_4  =     1552.62; FM1_A1_ba_err_4  =     11.4736 # 19 °C 5
161  FM1_A1_bs_4  =     7.18498; FM1_A1_bs_err_4  =    0.132788 # 19 °C 5
162  FM1_A1_ax_5  =     70.0848; FM1_A1_ax_err_5  =     1.10552 # 30 °C 5
163  FM1_A1_ex_5  =    0.104268; FM1_A1_ex_err_5  = 8.01692e-05 # 30 °C 5
164  FM1_A1_sx_5  =    0.339982; FM1_A1_sx_err_5  = 0.00512801 # 30 °C 5
165  FM1_A1_ba_5  =      1468.4; FM1_A1_ba_err_5  =      10.453 # 30 °C 5
166  FM1_A1_bs_5  =     7.65418; FM1_A1_bs_err_5  =    0.150792 # 30 °C 5
167  FM1_A1_ax_6  =     64.1669; FM1_A1_ax_err_6  =     1.05655 # 41 °C 5
168  FM1_A1_ex_6  =    0.102835; FM1_A1_ex_err_6  = 0.00011125 # 41 °C 5
169  FM1_A1_sx_6  =    0.464004; FM1_A1_sx_err_6  = 0.00805898 # 41 °C 5
170  FM1_A1_ba_6  =     1885.26; FM1_A1_ba_err_6  =      12.237 # 41 °C 5
171  FM1_A1_bs_6  =     7.25512; FM1_A1_bs_err_6  =     0.12193 # 41 °C 5
172  FM1_A1_ax_7  =     17.5112; FM1_A1_ax_err_7  =    0.550704 # 46 °C 5
173  FM1_A1_ex_7  =    0.103569; FM1_A1_ex_err_7  = 0.000194326 # 46 °C 5
174  FM1_A1_sx_7  =    0.415797; FM1_A1_sx_err_7  =   0.0132182 # 46 °C 5
175  FM1_A1_ba_7  =     461.103; FM1_A1_ba_err_7  =     5.95397 # 46 °C 5
176  FM1_A1_bs_7  =     7.82223; FM1_A1_bs_err_7  =    0.283343 # 46 °C 5
177  FM1_A2_ax_1  =     52.7108; FM1_A2_ax_err_1  =    0.948803 # -17 °C 6
178  FM1_A2_ex_1  =    0.103409; FM1_A2_ex_err_1  = 8.32337e-05 # -17 °C 6
179  FM1_A2_sx_1  =    0.313929; FM1_A2_sx_err_1  = 0.00529177 # -17 °C 6
180  FM1_A2_ba_1  =     879.512; FM1_A2_ba_err_1  =     8.17912 # -17 °C 6
181  FM1_A2_bs_1  =     7.71816; FM1_A2_bs_err_1  =    0.201226 # -17 °C 6
182  FM1_A2_ax_2  =      63.705; FM1_A2_ax_err_2  =      1.0741 # -9 °C 6
183  FM1_A2_ex_2  =    0.099887; FM1_A2_ex_err_2  = 7.29915e-05 # -9 °C 6
184  FM1_A2_sx_2  =    0.297472; FM1_A2_sx_err_2  = 0.00462873 # -9 °C 6
185  FM1_A2_ba_2  =      1056.4; FM1_A2_ba_err_2  =     9.25976 # -9 °C 6
186  FM1_A2_bs_2  =     8.13289; FM1_A2_bs_err_2  =    0.209741 # -9 °C 6
187  FM1_A2_ax_3  =     85.4466; FM1_A2_ax_err_3  =     1.23867 # +6 °C 6
188  FM1_A2_ex_3  =     0.10078; FM1_A2_ex_err_3  = 6.12841e-05 # +6 °C 6
189  FM1_A2_sx_3  =    0.292345; FM1_A2_sx_err_3  = 0.00390858 # +6 °C 6
190  FM1_A2_ba_3  =     1345.42; FM1_A2_ba_err_3  =     10.3459 # +6 °C 6
191  FM1_A2_bs_3  =       7.601; FM1_A2_bs_err_3  =    0.161726 # +6 °C 6
192  FM1_A2_ax_4  =     55.1419; FM1_A2_ax_err_4  =    0.920722 # 19 °C 6
193  FM1_A2_ex_4  =    0.101246; FM1_A2_ex_err_4  = 0.000125065 # 19 °C 6
194  FM1_A2_sx_4  =    0.511303; FM1_A2_sx_err_4  = 0.00933094 # 19 °C 6
195  FM1_A2_ba_4  =      1460.9; FM1_A2_ba_err_4  =     11.1625 # 19 °C 6
196  FM1_A2_bs_4  =     7.57717; FM1_A2_bs_err_4  =    0.154955 # 19 °C 6
197  FM1_A2_ax_5  =     60.3164; FM1_A2_ax_err_5  =    0.975436 # 30 °C 6
198  FM1_A2_ex_5  =    0.103632; FM1_A2_ex_err_5  = 0.000107095 # 30 °C 6
199  FM1_A2_sx_5  =    0.445175; FM1_A2_sx_err_5  = 0.00738959 # 30 °C 6
200  FM1_A2_ba_5  =     1380.78; FM1_A2_ba_err_5  =     10.4763 # 30 °C 6
201  FM1_A2_bs_5  =      7.4978; FM1_A2_bs_err_5  =    0.152068 # 30 °C 6
202  FM1_A2_ax_6  =     79.8408; FM1_A2_ax_err_6  =     1.14422 # 41 °C 6
203  FM1_A2_ex_6  =    0.102029; FM1_A2_ex_err_6  = 8.74646e-05 # 41 °C 6
204  FM1_A2_sx_6  =    0.416071; FM1_A2_sx_err_6  = 0.00598421 # 41 °C 6
205  FM1_A2_ba_6  =        1731; FM1_A2_ba_err_6  =     11.7039 # 41 °C 6
206  FM1_A2_bs_6  =       7.531; FM1_A2_bs_err_6  =    0.137831 # 41 °C 6
207  FM1_A2_ax_7  =     17.1855; FM1_A2_ax_err_7  =    0.528287 # 46 °C 6
208  FM1_A2_ex_7  =    0.102855; FM1_A2_ex_err_7  = 0.000209099 # 46 °C 6
209  FM1_A2_sx_7  =    0.463568; FM1_A2_sx_err_7  =   0.0149911 # 46 °C 6
210  FM1_A2_ba_7  =       433.4; FM1_A2_ba_err_7  =     5.90785 # 46 °C 6
211  FM1_A2_bs_7  =     7.49858; FM1_A2_bs_err_7  =    0.272787 # 46 °C 6
212  FM1_A3_ax_1  =     66.0319; FM1_A3_ax_err_1  =     1.17456 # -17 °C 7
213  FM1_A3_ex_1  =    0.103008; FM1_A3_ex_err_1  = 6.85259e-05 # -17 °C 7
214  FM1_A3_sx_1  =    0.264598; FM1_A3_sx_err_1  = 0.00457593 # -17 °C 7
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FM1_A3_ba_1  =    1298.75; FM1_A3_ba_err_1  =    9.71405 # -17 °C 7
FM1_A3_bs_1  =     8.1342; FM1_A3_bs_err_1  =   0.181614 # -17 °C 7
FM1_A3_ax_2  =    57.1097; FM1_A3_ax_err_2  =    1.05938 # -9 °C 7
FM1_A3_ex_2  =   0.100456; FM1_A3_ex_err_2  = 9.89397e-05 # -9 °C 7
FM1_A3_sx_2  =   0.360333; FM1_A3_sx_err_2  = 0.00655174 # -9 °C 7
FM1_A3_ba_2  =    1573.58; FM1_A3_ba_err_2  =    11.0196 # -9 °C 7
FM1_A3_bs_2  =     7.4714; FM1_A3_bs_err_2  =   0.141278 # -9 °C 7
FM1_A3_ax_3  =    76.1128; FM1_A3_ax_err_3  =    1.21811 # +6 °C 7
FM1_A3_ex_3  =   0.102485; FM1_A3_ex_err_3  = 8.10774e-05 # +6 °C 7
FM1_A3_sx_3  =   0.341974; FM1_A3_sx_err_3  = 0.00529144 # +6 °C 7
FM1_A3_ba_3  =    2001.16; FM1_A3_ba_err_3  =    12.1881 # +6 °C 7
FM1_A3_bs_3  =    7.65185; FM1_A3_bs_err_3  =   0.129433 # +6 °C 7
FM1_A3_ax_4  =     68.515; FM1_A3_ax_err_4  =    1.13773 # 19 °C 7
FM1_A3_ex_4  =   0.101821; FM1_A3_ex_err_4  = 0.000101507 # 19 °C 7
FM1_A3_sx_4  =   0.412174; FM1_A3_sx_err_4  = 0.00696389 # 19 °C 7
FM1_A3_ba_4  =       2104; FM1_A3_ba_err_4  =    12.7406 # 19 °C 7
FM1_A3_bs_4  =    7.91861; FM1_A3_bs_err_4  =   0.136319 # 19 °C 7
FM1_A3_ax_5  =    48.4782; FM1_A3_ax_err_5  =   0.847658 # 30 °C 7
FM1_A3_ex_5  =   0.103011; FM1_A3_ex_err_5  = 0.000163873 # 30 °C 7
FM1_A3_sx_5  =   0.622524; FM1_A3_sx_err_5  =  0.0129958 # 30 °C 7
FM1_A3_ba_5  =    1996.41; FM1_A3_ba_err_5  =    13.5523 # 30 °C 7
FM1_A3_bs_5  =    8.00748; FM1_A3_bs_err_5  =   0.147035 # 30 °C 7
FM1_A3_ax_6  =    64.2754; FM1_A3_ax_err_6  =    1.02124 # 41 °C 7
FM1_A3_ex_6  =   0.104043; FM1_A3_ex_err_6  = 0.000134685 # 41 °C 7
FM1_A3_sx_6  =   0.570551; FM1_A3_sx_err_6  =  0.0104436 # 41 °C 7
FM1_A3_ba_6  =    2511.36; FM1_A3_ba_err_6  =    14.7079 # 41 °C 7
FM1_A3_bs_6  =    7.89764; FM1_A3_bs_err_6  =   0.125106 # 41 °C 7
FM1_A3_ax_7  =    13.9493; FM1_A3_ax_err_7  =    0.44735 # 46 °C 7
FM1_A3_ex_7  =   0.104028; FM1_A3_ex_err_7  = 0.000319448 # 46 °C 7
FM1_A3_sx_7  =    0.65894; FM1_A3_sx_err_7  =  0.0258759 # 46 °C 7
FM1_A3_ba_7  =    622.137; FM1_A3_ba_err_7  =    7.76578 # 46 °C 7
FM1_A3_bs_7  =     7.3662; FM1_A3_bs_err_7  =   0.224168 # 46 °C 7
FM1_A4_ax_1  =    44.3963; FM1_A4_ax_err_1  =    0.88684 # -17 °C 8
FM1_A4_ex_1  =   0.103381; FM1_A4_ex_err_1  = 0.000119387 # -17 °C 8
FM1_A4_sx_1  =   0.397991; FM1_A4_sx_err_1  = 0.00795377 # -17 °C 8
FM1_A4_ba_1  =     1161.5; FM1_A4_ba_err_1  =    9.41161 # -17 °C 8
FM1_A4_bs_1  =    7.75877; FM1_A4_bs_err_1  =    0.17516 # -17 °C 8
FM1_A4_ax_2  =    51.5386; FM1_A4_ax_err_2  =   0.940457 # -9 °C 8
FM1_A4_ex_2  =   0.103688; FM1_A4_ex_err_2  = 0.000114264 # -9 °C 8
FM1_A4_sx_2  =   0.415301; FM1_A4_sx_err_2  = 0.00769558 # -9 °C 8
FM1_A4_ba_2  =    1350.43; FM1_A4_ba_err_2  =    10.1927 # -9 °C 8
FM1_A4_bs_2  =    7.79413; FM1_A4_bs_err_2  =   0.163724 # -9 °C 8
FM1_A4_ax_3  =    54.1771; FM1_A4_ax_err_3  =   0.928297 # +6 °C 8
FM1_A4_ex_3  =   0.101974; FM1_A4_ex_err_3  = 0.000137335 # +6 °C 8
FM1_A4_sx_3  =   0.535342; FM1_A4_sx_err_3  =  0.0103125 # +6 °C 8
FM1_A4_ba_3  =    1790.81; FM1_A4_ba_err_3  =    12.3788 # +6 °C 8
FM1_A4_bs_3  =    7.83561; FM1_A4_bs_err_3  =   0.148466 # +6 °C 8
FM1_A4_ax_4  =    59.7896; FM1_A4_ax_err_4  =    1.01821 # 19 °C 8
FM1_A4_ex_4  =   0.100889; FM1_A4_ex_err_4  = 0.000120727 # 19 °C 8
FM1_A4_sx_4  =   0.483586; FM1_A4_sx_err_4  = 0.00891891 # 19 °C 8
FM1_A4_ba_4  =    1868.11; FM1_A4_ba_err_4  =    12.4116 # 19 °C 8
FM1_A4_bs_4  =    7.80878; FM1_A4_bs_err_4  =   0.143671 # 19 °C 8
FM1_A4_ax_5  =    75.0372; FM1_A4_ax_err_5  =    1.18634 # 30 °C 8
FM1_A4_ex_5  =   0.101292; FM1_A4_ex_err_5  = 8.12547e-05 # 30 °C 8
FM1_A4_sx_5  =   0.352258; FM1_A4_sx_err_5  = 0.00535095 # 30 °C 8
FM1_A4_ba_5  =    1790.69; FM1_A4_ba_err_5  =    11.7489 # 30 °C 8
FM1_A4_bs_5  =    8.27614; FM1_A4_bs_err_5  =   0.163023 # 30 °C 8
FM1_A4_ax_6  =    81.8309; FM1_A4_ax_err_6  =    1.21067 # 41 °C 8
FM1_A4_ex_6  =   0.102107; FM1_A4_ex_err_6  = 9.09599e-05 # 41 °C 8
FM1_A4_sx_6  =   0.416343; FM1_A4_sx_err_6  = 0.00626542 # 41 °C 8
FM1_A4_ba_6  =    2251.22; FM1_A4_ba_err_6  =    13.2275 # 41 °C 8
FM1_A4_bs_6  =    7.94315; FM1_A4_bs_err_6  =   0.133178 # 41 °C 8
FM1_A4_ax_7  =    20.0377; FM1_A4_ax_err_7  =   0.585428 # 46 °C 8
FM1_A4_ex_7  =   0.102477; FM1_A4_ex_err_7  = 0.000192484 # 46 °C 8
FM1_A4_sx_7  =   0.444884; FM1_A4_sx_err_7  =  0.0134857 # 46 °C 8
FM1_A4_ba_7  =     545.07; FM1_A4_ba_err_7  =    6.56464 # 46 °C 8
FM1_A4_bs_7  =    8.40212; FM1_A4_bs_err_7  =   0.303754 # 46 °C 8
FM1_C1_bca_1 =    22.2573; FM1_C1_bca_err_1 =   0.793088 # -17 °C 1
FM1_C1_bcs_1 =     18.999; FM1_C1_bcs_err_1 =    1.12095 # -17 °C 1
FM1_C1_ac_1  =    25.3387; FM1_C1_ac_err_1  =    1.77736 # -17 °C 1
FM1_C1_ec_1  =   0.100997; FM1_C1_ec_err_1  = 0.000376188 # -17 °C 1
FM1_C1_sc_1  =   0.688061; FM1_C1_sc_err_1  =   0.284948 # -17 °C 1
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FM1_C1_bca_2 =    25.2884; FM1_C1_bca_err_2 =   0.964924 # -9 °C 1
FM1_C1_bcs_2 =    20.3983; FM1_C1_bcs_err_2 =    1.25539 # -9 °C 1
FM1_C1_ac_2  =    32.0307; FM1_C1_ac_err_2  =    2.11002 # -9 °C 1
FM1_C1_ec_2  =   0.102303; FM1_C1_ec_err_2  = 0.000467322 # -9 °C 1
FM1_C1_sc_2  =    1.41226; FM1_C1_sc_err_2  =   0.374599 # -9 °C 1
FM1_C1_bca_3 =    33.7224; FM1_C1_bca_err_3 =    1.05407 # +6 °C 1
FM1_C1_bcs_3 =     20.399; FM1_C1_bcs_err_3 =    1.05301 # +6 °C 1
FM1_C1_ac_3  =     43.008; FM1_C1_ac_err_3  =     2.3297 # +6 °C 1
FM1_C1_ec_3  =   0.102178; FM1_C1_ec_err_3  = 0.000360171 # +6 °C 1
FM1_C1_sc_3  =    1.13158; FM1_C1_sc_err_3  =   0.260107 # +6 °C 1
FM1_C1_bca_4 =    36.3938; FM1_C1_bca_err_4 =   0.992616 # 19 °C 1
FM1_C1_bcs_4 =    21.5984; FM1_C1_bcs_err_4 =    1.12151 # 19 °C 1
FM1_C1_ac_4  =     44.582; FM1_C1_ac_err_4  =    2.23664 # 19 °C 1
FM1_C1_ec_4  =   0.101827; FM1_C1_ec_err_4  = 0.000254539 # 19 °C 1
FM1_C1_sc_4  =   0.618373; FM1_C1_sc_err_4  =    0.18934 # 19 °C 1
FM1_C1_bca_5 =    31.7848; FM1_C1_bca_err_5 =    1.10643 # 30 °C 1
FM1_C1_bcs_5 =    19.7859; FM1_C1_bcs_err_5 =    1.01993 # 30 °C 1
FM1_C1_ac_5  =    40.7172; FM1_C1_ac_err_5  =    2.37962 # 30 °C 1
FM1_C1_ec_5  =   0.103225; FM1_C1_ec_err_5  = 0.000441594 # 30 °C 1
FM1_C1_sc_5  =    1.55045; FM1_C1_sc_err_5  =   0.341777 # 30 °C 1
FM1_C1_bca_6 =    41.5058; FM1_C1_bca_err_6 =    1.06332 # 41 °C 1
FM1_C1_bcs_6 =    19.7832; FM1_C1_bcs_err_6 =   0.840311 # 41 °C 1
FM1_C1_ac_6  =    47.6056; FM1_C1_ac_err_6  =    2.34752 # 41 °C 1
FM1_C1_ec_6  =   0.102988; FM1_C1_ec_err_6  = 0.000264329 # 41 °C 1
FM1_C1_sc_6  =   0.672457; FM1_C1_sc_err_6  =   0.201913 # 41 °C 1
FM1_C1_bca_7 =     9.5538; FM1_C1_bca_err_7 =   0.592567 # 46 °C 1
FM1_C1_bcs_7 =    23.2786; FM1_C1_bcs_err_7 =    2.60154 # 46 °C 1
FM1_C1_ac_7  =    13.2857; FM1_C1_ac_err_7  =    1.28635 # 46 °C 1
FM1_C1_ec_7  =   0.102894; FM1_C1_ec_err_7  = 0.000669912 # 46 °C 1
FM1_C1_sc_7  =     1.1758; FM1_C1_sc_err_7  =   0.500627 # 46 °C 1
FM1_C2_bca_1 =    28.3802; FM1_C2_bca_err_1 =   0.876781 # -17 °C 2
FM1_C2_bcs_1 =    22.2786; FM1_C2_bcs_err_1 =    1.21909 # -17 °C 2
FM1_C2_ac_1  =    31.0318; FM1_C2_ac_err_1  =    1.91527 # -17 °C 2
FM1_C2_ec_1  =   0.105404; FM1_C2_ec_err_1  = 0.000345106 # -17 °C 2
FM1_C2_sc_1  =   0.701161; FM1_C2_sc_err_1  =   0.273021 # -17 °C 2
FM1_C2_bca_2 =    36.2071; FM1_C2_bca_err_2 =    1.13958 # -9 °C 2
FM1_C2_bcs_2 =    23.1346; FM1_C2_bcs_err_2 =    1.29788 # -9 °C 2
FM1_C2_ac_2  =    33.4485; FM1_C2_ac_err_2  =    2.44673 # -9 °C 2
FM1_C2_ec_2  =   0.105307; FM1_C2_ec_err_2  = 0.000537087 # -9 °C 2
FM1_C2_sc_2  =     1.4002; FM1_C2_sc_err_2  =    0.41417 # -9 °C 2
FM1_C2_bca_3 =    46.1899; FM1_C2_bca_err_3 =    1.13697 # +6 °C 2
FM1_C2_bcs_3 =    23.1925; FM1_C2_bcs_err_3 =    1.08256 # +6 °C 2
FM1_C2_ac_3  =     46.471; FM1_C2_ac_err_3  =    2.49455 # +6 °C 2
FM1_C2_ec_3  =   0.104986; FM1_C2_ec_err_3  = 0.00032108 # +6 °C 2
FM1_C2_sc_3  =   0.837928; FM1_C2_sc_err_3  =   0.247011 # +6 °C 2
FM1_C2_bca_4 =    47.6485; FM1_C2_bca_err_4 =    1.28307 # 19 °C 2
FM1_C2_bcs_4 =    23.0982; FM1_C2_bcs_err_4 =    1.08552 # 19 °C 2
FM1_C2_ac_4  =    46.3329; FM1_C2_ac_err_4  =    2.75788 # 19 °C 2
FM1_C2_ec_4  =   0.105919; FM1_C2_ec_err_4  = 0.000435943 # 19 °C 2
FM1_C2_sc_4  =    1.35344; FM1_C2_sc_err_4  =   0.335228 # 19 °C 2
FM1_C2_bca_5 =    45.3102; FM1_C2_bca_err_5 =    1.12628 # 30 °C 2
FM1_C2_bcs_5 =    22.9617; FM1_C2_bcs_err_5 =    1.02639 # 30 °C 2
FM1_C2_ac_5  =     49.468; FM1_C2_ac_err_5  =    2.45298 # 30 °C 2
FM1_C2_ec_5  =    0.10597; FM1_C2_ec_err_5  = 0.000299385 # 30 °C 2
FM1_C2_sc_5  =   0.839043; FM1_C2_sc_err_5  =   0.231134 # 30 °C 2
FM1_C2_bca_6 =    60.9407; FM1_C2_bca_err_6 =    1.30231 # 41 °C 2
FM1_C2_bcs_6 =    25.7805; FM1_C2_bcs_err_6 =    1.18375 # 41 °C 2
FM1_C2_ac_6  =     59.712; FM1_C2_ac_err_6  =    2.89781 # 41 °C 2
FM1_C2_ec_6  =    0.10571; FM1_C2_ec_err_6  = 0.000286412 # 41 °C 2
FM1_C2_sc_6  =    0.83523; FM1_C2_sc_err_6  =   0.222453 # 41 °C 2
FM1_C2_bca_7 =    12.8959; FM1_C2_bca_err_7 =   0.720997 # 46 °C 2
FM1_C2_bcs_7 =    25.2514; FM1_C2_bcs_err_7 =    2.45188 # 46 °C 2
FM1_C2_ac_7  =    15.3966; FM1_C2_ac_err_7  =    1.52054 # 46 °C 2
FM1_C2_ec_7  =   0.107363; FM1_C2_ec_err_7  =  0.0008069 # 46 °C 2
FM1_C2_sc_7  =     1.6771; FM1_C2_sc_err_7  =   0.629478 # 46 °C 2
FM1_C3_bca_1 =     16.454; FM1_C3_bca_err_1 =    0.74988 # -17 °C 3
FM1_C3_bcs_1 =    14.8987; FM1_C3_bcs_err_1 =   0.713322 # -17 °C 3
FM1_C3_ac_1  =    21.4987; FM1_C3_ac_err_1  =    1.56044 # -17 °C 3
FM1_C3_ec_1  =   0.102743; FM1_C3_ec_err_1  = 0.000481461 # -17 °C 3
FM1_C3_sc_1  =     1.0403; FM1_C3_sc_err_1  =   0.364385 # -17 °C 3
FM1_C3_bca_2 =    19.2283; FM1_C3_bca_err_2 =   0.897525 # -9 °C 3
FM1_C3_bcs_2 =    14.7588; FM1_C3_bcs_err_2 =   0.655643 # -9 °C 3
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FM1_C3_ac_2  =    28.0336; FM1_C3_ac_err_2  =    1.83262 # -9 °C 3
FM1_C3_ec_2  =   0.103007; FM1_C3_ec_err_2  = 0.000521333 # -9 °C 3
FM1_C3_sc_2  =    1.65944; FM1_C3_sc_err_2  =   0.399382 # -9 °C 3
FM1_C3_bca_3 =    26.9959; FM1_C3_bca_err_3 =   0.873208 # +6 °C 3
FM1_C3_bcs_3 =    15.6182; FM1_C3_bcs_err_3 =   0.587422 # +6 °C 3
FM1_C3_ac_3  =    34.8077; FM1_C3_ac_err_3  =    1.86851 # +6 °C 3
FM1_C3_ec_3  =   0.103338; FM1_C3_ec_err_3  = 0.000307922 # +6 °C 3
FM1_C3_sc_3  =   0.707609; FM1_C3_sc_err_3  =    0.21678 # +6 °C 3
FM1_C3_bca_4 =    30.3199; FM1_C3_bca_err_4 =   0.87677 # 19 °C 3
FM1_C3_bcs_4 =    16.0157; FM1_C3_bcs_err_4 =   0.591887 # 19 °C 3
FM1_C3_ac_4  =    36.2285; FM1_C3_ac_err_4  =      1.904 # 19 °C 3
FM1_C3_ec_4  =    0.10304; FM1_C3_ec_err_4  = 0.000244608 # 19 °C 3
FM1_C3_sc_4  =   0.440587; FM1_C3_sc_err_4  =   0.170285 # 19 °C 3
FM1_C3_bca_5 =    28.1272; FM1_C3_bca_err_5 =   0.992619 # 30 °C 3
FM1_C3_bcs_5 =    16.3955; FM1_C3_bcs_err_5 =   0.671481 # 30 °C 3
FM1_C3_ac_5  =    36.0852; FM1_C3_ac_err_5  =    2.06611 # 30 °C 3
FM1_C3_ec_5  =   0.103538; FM1_C3_ec_err_5  = 0.000407612 # 30 °C 3
FM1_C3_sc_5  =    1.24733; FM1_C3_sc_err_5  =    0.30494 # 30 °C 3
FM1_C3_bca_6 =    35.2879; FM1_C3_bca_err_6 =    1.12213 # 41 °C 3
FM1_C3_bcs_6 =    15.4963; FM1_C3_bcs_err_6 =   0.519222 # 41 °C 3
FM1_C3_ac_6  =    39.1882; FM1_C3_ac_err_6  =    2.29019 # 41 °C 3
FM1_C3_ec_6  =   0.104578; FM1_C3_ec_err_6  = 0.000414225 # 41 °C 3
FM1_C3_sc_6  =    1.22391; FM1_C3_sc_err_6  =   0.326999 # 41 °C 3
FM1_C3_bca_7 =    6.96953; FM1_C3_bca_err_7 =   0.561887 # 46 °C 3
FM1_C3_bcs_7 =    14.1819; FM1_C3_bcs_err_7 =   0.938876 # 46 °C 3
FM1_C3_ac_7  =    10.2018; FM1_C3_ac_err_7  =    1.10872 # 46 °C 3
FM1_C3_ec_7  =   0.104288; FM1_C3_ec_err_7  = 0.00088309 # 46 °C 3
FM1_C3_sc_7  =     1.5576; FM1_C3_sc_err_7  =   0.675192 # 46 °C 3
FM1_C4_bca_1 =    46.6154; FM1_C4_bca_err_1 =    1.61974 # -17 °C 4
FM1_C4_bcs_1 =    20.1313; FM1_C4_bcs_err_1 =    1.17812 # -17 °C 4
FM1_C4_ac_1  =    35.9662; FM1_C4_ac_err_1  =    3.52062 # -17 °C 4
FM1_C4_ec_1  =  0.0991982; FM1_C4_ec_err_1  = 0.000772133 # -17 °C 4
FM1_C4_sc_1  =    2.21997; FM1_C4_sc_err_1  =   0.588308 # -17 °C 4
FM1_C4_bca_2 =    54.2034; FM1_C4_bca_err_2 =    1.97891 # -9 °C 4
FM1_C4_bcs_2 =    19.9326; FM1_C4_bcs_err_2 =    1.13045 # -9 °C 4
FM1_C4_ac_2  =     43.577; FM1_C4_ac_err_2  =    4.25962 # -9 °C 4
FM1_C4_ec_2  =  0.0997908; FM1_C4_ec_err_2  =  0.0008277 # -9 °C 4
FM1_C4_sc_2  =    2.85285; FM1_C4_sc_err_2  =   0.639779 # -9 °C 4
FM1_C4_bca_3 =    69.0868; FM1_C4_bca_err_3 =    2.07561 # +6 °C 4
FM1_C4_bcs_3 =    19.5591; FM1_C4_bcs_err_3 =   0.889977 # +6 °C 4
FM1_C4_ac_3  =    53.0061; FM1_C4_ac_err_3  =     4.3471 # +6 °C 4
FM1_C4_ec_3  =   0.100237; FM1_C4_ec_err_3  = 0.000678233 # +6 °C 4
FM1_C4_sc_3  =    2.44772; FM1_C4_sc_err_3  =     0.5219 # +6 °C 4
FM1_C4_bca_4 =    75.1332; FM1_C4_bca_err_4 =    2.85209 # 19 °C 4
FM1_C4_bcs_4 =    21.6691; FM1_C4_bcs_err_4 =    1.38894 # 19 °C 4
FM1_C4_ac_4  =    64.5665; FM1_C4_ac_err_4  =    6.54589 # 19 °C 4
FM1_C4_ec_4  =  0.0992669; FM1_C4_ec_err_4  = 0.000910179 # 19 °C 4
FM1_C4_sc_4  =    4.02653; FM1_C4_sc_err_4  =   0.683535 # 19 °C 4
FM1_C4_bca_5 =    70.4877; FM1_C4_bca_err_5 =    1.91351 # 30 °C 4
FM1_C4_bcs_5 =    20.3464; FM1_C4_bcs_err_5 =   0.907519 # 30 °C 4
FM1_C4_ac_5  =    53.9723; FM1_C4_ac_err_5  =    4.09721 # 30 °C 4
FM1_C4_ec_5  =   0.100815; FM1_C4_ec_err_5  = 0.000597443 # 30 °C 4
FM1_C4_sc_5  =    2.09144; FM1_C4_sc_err_5  =   0.462571 # 30 °C 4
FM1_C4_bca_6 =     87.267; FM1_C4_bca_err_6 =    2.10969 # 41 °C 4
FM1_C4_bcs_6 =     21.664; FM1_C4_bcs_err_6 =   0.901533 # 41 °C 4
FM1_C4_ac_6  =    73.0113; FM1_C4_ac_err_6  =     4.5603 # 41 °C 4
FM1_C4_ec_6  =   0.101626; FM1_C4_ec_err_6  = 0.000515965 # 41 °C 4
FM1_C4_sc_6  =    2.19555; FM1_C4_sc_err_6  =   0.388725 # 41 °C 4
FM1_C4_bca_7 =    18.7053; FM1_C4_bca_err_7 =     1.0902 # 46 °C 4
FM1_C4_bcs_7 =    19.9453; FM1_C4_bcs_err_7 =    1.65779 # 46 °C 4
FM1_C4_ac_7  =    20.0471; FM1_C4_ac_err_7  =    2.34195 # 46 °C 4
FM1_C4_ec_7  =   0.101709; FM1_C4_ec_err_7  = 0.00106005 # 46 °C 4
FM1_C4_sc_7  =    2.79559; FM1_C4_sc_err_7  =   0.821858 # 46 °C 4
FM1_A1_bca_1 =    78.5376; FM1_A1_bca_err_1 =    1.39453 # -17 °C 5
FM1_A1_bcs_1 =    19.4785; FM1_A1_bcs_err_1 =   0.581581 # -17 °C 5
FM1_A1_ac_1  =    76.1712; FM1_A1_ac_err_1  =     3.1244 # -17 °C 5
FM1_A1_ec_1  =   0.103679; FM1_A1_ec_err_1  = 0.000193551 # -17 °C 5
FM1_A1_sc_1  =   0.526176; FM1_A1_sc_err_1  =   0.156794 # -17 °C 5
FM1_A1_bca_2 =    92.0499; FM1_A1_bca_err_2 =    1.73718 # -9 °C 5
FM1_A1_bcs_2 =    19.7796; FM1_A1_bcs_err_2 =   0.568589 # -9 °C 5
FM1_A1_ac_2  =    92.6182; FM1_A1_ac_err_2  =    3.70929 # -9 °C 5
FM1_A1_ec_2  =   0.104404; FM1_A1_ec_err_2  = 0.000274641 # -9 °C 5
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FM1_A1_sc_2  =    1.15968; FM1_A1_sc_err_2  =   0.206643 # -9 °C 5
FM1_A1_bca_3 =     121.82; FM1_A1_bca_err_3 =    1.80024 # +6 °C 5
FM1_A1_bcs_3 =      19.88; FM1_A1_bcs_err_3 =   0.485259 # +6 °C 5
FM1_A1_ac_3  =    120.083; FM1_A1_ac_err_3  =    3.96061 # +6 °C 5
FM1_A1_ec_3  =   0.104141; FM1_A1_ec_err_3  = 0.000179471 # +6 °C 5
FM1_A1_sc_3  =    0.69469; FM1_A1_sc_err_3  =   0.139334 # +6 °C 5
FM1_A1_bca_4 =    123.828; FM1_A1_bca_err_4 =    1.88048 # 19 °C 5
FM1_A1_bcs_4 =    20.1926; FM1_A1_bcs_err_4 =   0.495033 # 19 °C 5
FM1_A1_ac_4  =    119.662; FM1_A1_ac_err_4  =    4.08466 # 19 °C 5
FM1_A1_ec_4  =   0.105004; FM1_A1_ec_err_4  = 0.000202726 # 19 °C 5
FM1_A1_sc_4  =   0.838445; FM1_A1_sc_err_4  =   0.156071 # 19 °C 5
FM1_A1_bca_5 =    118.088; FM1_A1_bca_err_5 =    1.78449 # 30 °C 5
FM1_A1_bcs_5 =    19.3205; FM1_A1_bcs_err_5 =   0.455679 # 30 °C 5
FM1_A1_ac_5  =    116.123; FM1_A1_ac_err_5  =    3.88953 # 30 °C 5
FM1_A1_ec_5  =   0.104621; FM1_A1_ec_err_5  = 0.000186358 # 30 °C 5
FM1_A1_sc_5  =   0.709508; FM1_A1_sc_err_5  =   0.140768 # 30 °C 5
FM1_A1_bca_6 =    147.874; FM1_A1_bca_err_6 =     2.0713 # 41 °C 5
FM1_A1_bcs_6 =    19.5698; FM1_A1_bcs_err_6 =   0.423313 # 41 °C 5
FM1_A1_ac_6  =    142.594; FM1_A1_ac_err_6  =    4.47054 # 41 °C 5
FM1_A1_ec_6  =   0.104927; FM1_A1_ec_err_6  = 0.000190035 # 41 °C 5
FM1_A1_sc_6  =   0.878275; FM1_A1_sc_err_6  =   0.146361 # 41 °C 5
FM1_A1_bca_7 =     34.135; FM1_A1_bca_err_7 =    1.26976 # 46 °C 5
FM1_A1_bcs_7 =    20.3312; FM1_A1_bcs_err_7 =    1.02293 # 46 °C 5
FM1_A1_ac_7  =    37.3651; FM1_A1_ac_err_7  =    2.62854 # 46 °C 5
FM1_A1_ec_7  =   0.105884; FM1_A1_ec_err_7  = 0.000614507 # 46 °C 5
FM1_A1_sc_7  =    2.14408; FM1_A1_sc_err_7  =   0.479305 # 46 °C 5
FM1_A2_bca_1 =    100.954; FM1_A2_bca_err_1 =    4.75853 # -17 °C 6
FM1_A2_bcs_1 =    20.4795; FM1_A2_bcs_err_1 =   0.608891 # -17 °C 6
FM1_A2_ac_1  =    86.8413; FM1_A2_ac_err_1  =    5.55992 # -17 °C 6
FM1_A2_ec_1  =   0.101228; FM1_A2_ec_err_1  = 0.00223174 # -17 °C 6
FM1_A2_sc_1  =   0.116359; FM1_A2_sc_err_1  =    4.25564 # -17 °C 6
FM1_A2_bca_2 =    118.673; FM1_A2_bca_err_2 =    2.02599 # -9 °C 6
FM1_A2_bcs_2 =    22.3607; FM1_A2_bcs_err_2 =   0.756343 # -9 °C 6
FM1_A2_ac_2  =    121.828; FM1_A2_ac_err_2  =    4.61486 # -9 °C 6
FM1_A2_ec_2  =   0.100921; FM1_A2_ec_err_2  = 0.000263366 # -9 °C 6
FM1_A2_sc_2  =    1.39626; FM1_A2_sc_err_2  =   0.202971 # -9 °C 6
FM1_A2_bca_3 =     153.38; FM1_A2_bca_err_3 =    2.03763 # +6 °C 6
FM1_A2_bcs_3 =     20.694; FM1_A2_bcs_err_3 =   0.523761 # +6 °C 6
FM1_A2_ac_3  =    134.217; FM1_A2_ac_err_3  =     4.6462 # +6 °C 6
FM1_A2_ec_3  =    0.10161; FM1_A2_ec_err_3  = 0.000189639 # +6 °C 6
FM1_A2_sc_3  =   0.759873; FM1_A2_sc_err_3  =   0.146898 # +6 °C 6
FM1_A2_bca_4 =    158.624; FM1_A2_bca_err_4 =    2.23906 # 19 °C 6
FM1_A2_bcs_4 =    21.9047; FM1_A2_bcs_err_4 =   0.593005 # 19 °C 6
FM1_A2_ac_4  =    150.224; FM1_A2_ac_err_4  =    5.04984 # 19 °C 6
FM1_A2_ec_4  =   0.102091; FM1_A2_ec_err_4  = 0.000219625 # 19 °C 6
FM1_A2_sc_4  =    1.15305; FM1_A2_sc_err_4  =   0.169884 # 19 °C 6
FM1_A2_bca_5 =    156.372; FM1_A2_bca_err_5 =    2.08288 # 30 °C 6
FM1_A2_bcs_5 =    21.6433; FM1_A2_bcs_err_5 =    0.55791 # 30 °C 6
FM1_A2_ac_5  =    139.901; FM1_A2_ac_err_5  =    4.71121 # 30 °C 6
FM1_A2_ec_5  =   0.102497; FM1_A2_ec_err_5  = 0.000194204 # 30 °C 6
FM1_A2_sc_5  =   0.841716; FM1_A2_sc_err_5  =   0.151516 # 30 °C 6
FM1_A2_bca_6 =    189.613; FM1_A2_bca_err_6 =    2.87871 # 41 °C 6
FM1_A2_bcs_6 =    21.7679; FM1_A2_bcs_err_6 =   0.570242 # 41 °C 6
FM1_A2_ac_6  =    182.617; FM1_A2_ac_err_6  =    6.29852 # 41 °C 6
FM1_A2_ec_6  =   0.102528; FM1_A2_ec_err_6  = 0.000278188 # 41 °C 6
FM1_A2_sc_6  =    1.96133; FM1_A2_sc_err_6  =   0.211241 # 41 °C 6
FM1_A2_bca_7 =    46.7493; FM1_A2_bca_err_7 =    1.18526 # 46 °C 6
FM1_A2_bcs_7 =    20.9046; FM1_A2_bcs_err_7 =   0.969275 # 46 °C 6
FM1_A2_ac_7  =    40.4293; FM1_A2_ac_err_7  =    2.64673 # 46 °C 6
FM1_A2_ec_7  =   0.102334; FM1_A2_ec_err_7  = 0.000395766 # 46 °C 6
FM1_A2_sc_7  =   0.942824; FM1_A2_sc_err_7  =    0.30894 # 46 °C 6
FM1_A3_bca_1 =    63.6135; FM1_A3_bca_err_1 =    1.51781 # -17 °C 7
FM1_A3_bcs_1 =    15.4199; FM1_A3_bcs_err_1 =   0.403208 # -17 °C 7
FM1_A3_ac_1  =    72.1276; FM1_A3_ac_err_1  =    3.14256 # -17 °C 7
FM1_A3_ec_1  =   0.103029; FM1_A3_ec_err_1  = 0.000312755 # -17 °C 7
FM1_A3_sc_1  =    1.33678; FM1_A3_sc_err_1  =   0.245355 # -17 °C 7
FM1_A3_bca_2 =    80.1473; FM1_A3_bca_err_2 =    1.53093 # -9 °C 7
FM1_A3_bcs_2 =    16.2183; FM1_A3_bcs_err_2 =   0.399936 # -9 °C 7
FM1_A3_ac_2  =    85.8404; FM1_A3_ac_err_2  =    3.29664 # -9 °C 7
FM1_A3_ec_2  =   0.102232; FM1_A3_ec_err_2  = 0.000228604 # -9 °C 7
FM1_A3_sc_2  =   0.848531; FM1_A3_sc_err_2  =   0.175064 # -9 °C 7
FM1_A3_bca_3 =    100.618; FM1_A3_bca_err_3 =    1.71044 # +6 °C 7
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FM1_A3_bcs_3 =    15.4886; FM1_A3_bcs_err_3 =   0.315374 # +6 °C 7
FM1_A3_ac_3  =     102.28; FM1_A3_ac_err_3  =    3.64072 # +6 °C 7
FM1_A3_ec_3  =   0.103049; FM1_A3_ec_err_3  = 0.000207435 # +6 °C 7
FM1_A3_sc_3  =    0.80083; FM1_A3_sc_err_3  =   0.160761 # +6 °C 7
FM1_A3_bca_4 =     107.552; FM1_A3_bca_err_4 =    1.70248 # 19 °C 7
FM1_A3_bcs_4 =    15.5707; FM1_A3_bcs_err_4 =   0.305793 # 19 °C 7
FM1_A3_ac_4  =     107.895; FM1_A3_ac_err_4  =    3.67299 # 19 °C 7
FM1_A3_ec_4  =   0.102882; FM1_A3_ec_err_4  = 0.000182937 # 19 °C 7
FM1_A3_sc_4  =    0.67045; FM1_A3_sc_err_4  =   0.144758 # 19 °C 7
FM1_A3_bca_5 =    98.3609; FM1_A3_bca_err_5 =    1.78729 # 30 °C 7
FM1_A3_bcs_5 =    15.1634; FM1_A3_bcs_err_5 =   0.296282 # 30 °C 7
FM1_A3_ac_5  =     103.457; FM1_A3_ac_err_5  =    3.68113 # 30 °C 7
FM1_A3_ec_5  =    0.10408; FM1_A3_ec_err_5  = 0.000235335 # 30 °C 7
FM1_A3_sc_5  =    1.01893; FM1_A3_sc_err_5  =    0.17553 # 30 °C 7
FM1_A3_bca_6 =     133.306; FM1_A3_bca_err_6 =    2.23516 # 41 °C 7
FM1_A3_bcs_6 =     16.155; FM1_A3_bcs_err_6 =   0.307779 # 41 °C 7
FM1_A3_ac_6  =     138.704; FM1_A3_ac_err_6  =     4.5769 # 41 °C 7
FM1_A3_ec_6  =   0.103919; FM1_A3_ec_err_6  = 0.000242199 # 41 °C 7
FM1_A3_sc_6  =    1.39156; FM1_A3_sc_err_6  =   0.185519 # 41 °C 7
FM1_A3_bca_7 =    29.2804; FM1_A3_bca_err_7 =    1.30358 # 46 °C 7
FM1_A3_bcs_7 =    15.9612; FM1_A3_bcs_err_7 =   0.658636 # 46 °C 7
FM1_A3_ac_7  =    35.6733; FM1_A3_ac_err_7  =    2.57297 # 46 °C 7
FM1_A3_ec_7  =   0.105146; FM1_A3_ec_err_7  = 0.000675264 # 46 °C 7
FM1_A3_sc_7  =    2.54473; FM1_A3_sc_err_7  =   0.521909 # 46 °C 7
FM1_A4_bca_1 =     136.224; FM1_A4_bca_err_1 =    2.59235 # −17 °C 8
FM1_A4_bcs_1 =    21.0395; FM1_A4_bcs_err_1 =   0.660683 # −17 °C 8
FM1_A4_ac_1  =     121.357; FM1_A4_ac_err_1  =    5.60239 # −17 °C 8
FM1_A4_ec_1  =   0.101787; FM1_A4_ec_err_1  = 0.000381578 # −17 °C 8
FM1_A4_sc_1  =    2.17263; FM1_A4_sc_err_1  =   0.290284 # −17 °C 8
FM1_A4_bca_2 =     165.664; FM1_A4_bca_err_2 =    3.40179 # −9 °C 8
FM1_A4_bcs_2 =    21.0107; FM1_A4_bcs_err_2 =   0.695213 # −9 °C 8
FM1_A4_ac_2  =     146.095; FM1_A4_ac_err_2  =    7.42367 # −9 °C 8
FM1_A4_ec_2  =   0.100821; FM1_A4_ec_err_2  = 0.000448495 # −9 °C 8
FM1_A4_sc_2  =    2.97673; FM1_A4_sc_err_2  =   0.334597 # −9 °C 8
FM1_A4_bca_3 =     206.717; FM1_A4_bca_err_3 =      3.739 # +6 °C 8
FM1_A4_bcs_3 =    20.5093; FM1_A4_bcs_err_3 =   0.561989 # +6 °C 8
FM1_A4_ac_3  =     176.531; FM1_A4_ac_err_3  =    7.94058 # +6 °C 8
FM1_A4_ec_3  =   0.101632; FM1_A4_ec_err_3  = 0.000398126 # +6 °C 8
FM1_A4_sc_3  =     2.8696; FM1_A4_sc_err_3  =   0.302015 # +6 °C 8
FM1_A4_bca_4 =     218.263; FM1_A4_bca_err_4 =    4.03743 # 19 °C 8
FM1_A4_bcs_4 =    21.3333; FM1_A4_bcs_err_4 =   0.624105 # 19 °C 8
FM1_A4_ac_4  =     206.187; FM1_A4_ac_err_4  =    8.85753 # 19 °C 8
FM1_A4_ec_4  =   0.101403; FM1_A4_ec_err_4  = 0.000394433 # 19 °C 8
FM1_A4_sc_4  =    3.26152; FM1_A4_sc_err_4  =   0.293743 # 19 °C 8
FM1_A4_bca_5 =     205.413; FM1_A4_bca_err_5 =    4.06183 # 30 °C 8
FM1_A4_bcs_5 =    20.7003; FM1_A4_bcs_err_5 =   0.602642 # 30 °C 8
FM1_A4_ac_5  =     186.787; FM1_A4_ac_err_5  =    8.69174 # 30 °C 8
FM1_A4_ec_5  =   0.101837; FM1_A4_ec_err_5  = 0.000433365 # 30 °C 8
FM1_A4_sc_5  =    3.37447; FM1_A4_sc_err_5  =   0.322539 # 30 °C 8
FM1_A4_bca_6 =     251.337; FM1_A4_bca_err_6 =    3.51583 # 41 °C 8
FM1_A4_bcs_6 =    20.5424; FM1_A4_bcs_err_6 =   0.435871 # 41 °C 8
FM1_A4_ac_6  =     223.309; FM1_A4_ac_err_6  =    7.38555 # 41 °C 8
FM1_A4_ec_6  =   0.103182; FM1_A4_ec_err_6  = 0.000278349 # 41 °C 8
FM1_A4_sc_6  =    2.13565; FM1_A4_sc_err_6  =   0.209753 # 41 °C 8
FM1_A4_bca_7 =    60.4357; FM1_A4_bca_err_7 =    1.62566 # 46 °C 8
FM1_A4_bcs_7 =    19.3095; FM1_A4_bcs_err_7 =   0.756902 # 46 °C 8
FM1_A4_ac_7  =     50.1113; FM1_A4_ac_err_7  =    3.35904 # 46 °C 8
FM1_A4_ec_7  =   0.102846; FM1_A4_ec_err_7  = 0.000516882 # 46 °C 8
FM1_A4_sc_7  =    1.66173; FM1_A4_sc_err_7  =   0.391113 # 46 °C 8
FM1_C1_ee0 =    0.101853; FM1_C1_ee0_err = 7.06008e-05
FM1_C1_ee1 =   0.0673102; FM1_C1_ee1_err = 0.00385594
FM1_C1_ee2 =    -14.2535; FM1_C1_ee2_err =     1.1807
FM1_C2_ee0 =     0.10314; FM1_C2_ee0_err = 8.8125e-05
FM1_C2_ee1 = -0.0463534; FM1_C2_ee1_err = 0.00576595
FM1_C2_ee2 =      19.837; FM1_C2_ee2_err =    1.57675
FM1_C3_ee0 =    0.103353; FM1_C3_ee0_err = 7.9454e-05
FM1_C3_ee1 = 0.00373413; FM1_C3_ee1_err =  0.0039587
FM1_C3_ee2 =   -0.143171; FM1_C3_ee2_err =    1.40964
FM1_C4_ee0 =     0.10143; FM1_C4_ee0_err = 6.8662e-05
FM1_C4_ee1 =   0.0361386; FM1_C4_ee1_err = 0.00419164
FM1_C4_ee2 =    -1.34722; FM1_C4_ee2_err =    1.25134
FM1_A1_ee0 =    0.103526; FM1_A1_ee0_err = 5.75322e-05
FM1_A1_ee1 = -0.00986004; FM1_A1_ee1_err = 0.00271615
FM1_A1_ee2 =     5.32095; FM1_A1_ee2_err =    1.00666
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FM1_A2_ee0 =    0.101002; FM1_A2_ee0_err = 4.14625e-05
FM1_A2_ee1 = -0.0270901; FM1_A2_ee1_err = 0.00281463
FM1_A2_ee2 =     17.1332; FM1_A2_ee2_err =     0.90333
FM1_A3_ee0 =    0.101969; FM1_A3_ee0_err = 4.92219e-05
FM1_A3_ee1 = -0.00989921; FM1_A3_ee1_err = 0.00261626
FM1_A3_ee2 =     14.8391; FM1_A3_ee2_err =     1.01089
FM1_A4_ee0 =    0.102039; FM1_A4_ee0_err = 6.45426e-05
FM1_A4_ee1 = -0.0710404; FM1_A4_ee1_err = 0.00368369
FM1_A4_ee2 =      17.418; FM1_A4_ee2_err =     1.18882
FM1_EPT_e0 =     1.00033; FM1_EPT_e0_err = 2.08576e-05
FM1_EPT_e1 = -0.00975573; FM1_EPT_e1_err = 0.000120154
FM1_EPT_e2 =     7.45577; FM1_EPT_e2_err =  0.0401553
FM1_C1H_ax_1  =     17.8714; FM1_C1H_ax_err_1  =     0.25154 # -17 °C
FM1_C1H_ex_1  =    0.594382; FM1_C1H_ex_err_1  = 0.000327308 # -17 °C
FM1_C1H_sx_1  =     1.62004; FM1_C1H_sx_err_1  =  0.0214687 # -17 °C
FM1_C1H_ab_1  =     4.06093; FM1_C1H_ab_err_1  =    0.109434 # -17 °C
FM1_C1H_ba_1  =     0.08736; FM1_C1H_ba_err_1  =    0.215212 # -17 °C
FM1_C1H_bs_1  =     3.20155; FM1_C1H_bs_err_1  =     1.31594 # -17 °C
FM1_C1H_bca_1 =     51.6979; FM1_C1H_bca_err_1 =    0.646833 # -17 °C
FM1_C1H_bcs_1 =     120.768; FM1_C1H_bcs_err_1 =     1.07519 # -17 °C
FM1_C1H_ac_1  =     28.4565; FM1_C1H_ac_err_1  =    0.993033 # -17 °C
FM1_C1H_ec_1  =    0.592932; FM1_C1H_ec_err_1  = 0.00196831 # -17 °C
FM1_C1H_sc_1  =     9.45248; FM1_C1H_sc_err_1  =     1.50712 # -17 °C
FM1_C1H_ax_2  =     19.8944; FM1_C1H_ax_err_2  =    0.264978 # -9 °C
FM1_C1H_ex_2  =    0.603776; FM1_C1H_ex_err_2  = 0.000304672 # -9 °C
FM1_C1H_sx_2  =      1.6109; FM1_C1H_sx_err_2  =  0.0201355 # -9 °C
FM1_C1H_ab_2  =      4.5066; FM1_C1H_ab_err_2  =    0.104475 # -9 °C
FM1_C1H_ba_2  =   0.0100939; FM1_C1H_ba_err_2  =  0.0241791 # -9 °C
FM1_C1H_bs_2  =       2.349; FM1_C1H_bs_err_2  =    0.656583 # -9 °C
FM1_C1H_bca_2 =     56.2587; FM1_C1H_bca_err_2 =    0.635431 # -9 °C
FM1_C1H_bcs_2 =     124.889; FM1_C1H_bcs_err_2 =     1.06058 # -9 °C
FM1_C1H_ac_2  =     30.9669; FM1_C1H_ac_err_2  =     1.01304 # -9 °C
FM1_C1H_ec_2  =    0.602693; FM1_C1H_ec_err_2  = 0.00170329 # -9 °C
FM1_C1H_sc_2  =     8.02503; FM1_C1H_sc_err_2  =     1.31795 # -9 °C
FM1_C1H_ax_3  =     15.7226; FM1_C1H_ax_err_3  =    0.209589 # +6 °C
FM1_C1H_ex_3  =    0.616753; FM1_C1H_ex_err_3  = 0.000590394 # +6 °C
FM1_C1H_sx_3  =     2.62647; FM1_C1H_sx_err_3  =  0.0361016 # +6 °C
FM1_C1H_ab_3  =     5.05816; FM1_C1H_ab_err_3  =    0.174876 # +6 °C
FM1_C1H_ba_3  =     3.39114; FM1_C1H_ba_err_3  =      3.0208 # +6 °C
FM1_C1H_bs_3  =     6.76284; FM1_C1H_bs_err_3  =      2.0159 # +6 °C
FM1_C1H_bca_3 =     68.8732; FM1_C1H_bca_err_3 =    0.707695 # +6 °C
FM1_C1H_bcs_3 =     131.818; FM1_C1H_bcs_err_3 =     1.12191 # +6 °C
FM1_C1H_ac_3  =     38.3372; FM1_C1H_ac_err_3  =     1.15448 # +6 °C
FM1_C1H_ec_3  =    0.609967; FM1_C1H_ec_err_3  = 0.00153738 # +6 °C
FM1_C1H_sc_3  =        7.97; FM1_C1H_sc_err_3  =     1.16327 # +6 °C
FM1_C1H_ax_4  =     14.8353; FM1_C1H_ax_err_4  =    0.194599 # 19 °C
FM1_C1H_ex_4  =    0.618884; FM1_C1H_ex_err_4  = 0.000709284 # 19 °C
FM1_C1H_sx_4  =     3.01142; FM1_C1H_sx_err_4  =  0.0450775 # 19 °C
FM1_C1H_ab_4  =     4.66379; FM1_C1H_ab_err_4  =    0.163532 # 19 °C
FM1_C1H_ba_4  =     1.21619; FM1_C1H_ba_err_4  =     1.17651 # 19 °C
FM1_C1H_bs_4  =     5.04385; FM1_C1H_bs_err_4  =     1.19877 # 19 °C
FM1_C1H_bca_4 =     71.0782; FM1_C1H_bca_err_4 =    0.702386 # 19 °C
FM1_C1H_bcs_4 =     131.972; FM1_C1H_bcs_err_4 =     1.06807 # 19 °C
FM1_C1H_ac_4  =      39.154; FM1_C1H_ac_err_4  =     1.15621 # 19 °C
FM1_C1H_ec_4  =    0.614938; FM1_C1H_ec_err_4  = 0.00143466 # 19 °C
FM1_C1H_sc_4  =        7.24; FM1_C1H_sc_err_4  =     1.10126 # 19 °C
FM1_C1H_ax_5  =     20.8221; FM1_C1H_ax_err_5  =    0.256149 # 30 °C
FM1_C1H_ex_5  =    0.618731; FM1_C1H_ex_err_5  = 0.000355648 # 30 °C
FM1_C1H_sx_5  =     1.92629; FM1_C1H_sx_err_5  =  0.0225076 # 30 °C
FM1_C1H_ab_5  =     5.38205; FM1_C1H_ab_err_5  =    0.125217 # 30 °C
FM1_C1H_ba_5  =    0.209551; FM1_C1H_ba_err_5  =    0.361813 # 30 °C
FM1_C1H_bs_5  =     3.80527; FM1_C1H_bs_err_5  =     1.20224 # 30 °C
FM1_C1H_bca_5 =     70.7653; FM1_C1H_bca_err_5 =    0.706442 # 30 °C
FM1_C1H_bcs_5 =     125.964; FM1_C1H_bcs_err_5 =    0.930877 # 30 °C
FM1_C1H_ac_5  =     36.0371; FM1_C1H_ac_err_5  =     1.13054 # 30 °C
FM1_C1H_ec_5  =     0.61574; FM1_C1H_ec_err_5  = 0.00146388 # 30 °C
FM1_C1H_sc_5  =     6.47268; FM1_C1H_sc_err_5  =       1.108 # 30 °C
FM1_C1H_ax_6  =     19.9022; FM1_C1H_ax_err_6  =    0.238836 # 41 °C
FM1_C1H_ex_6  =    0.617997; FM1_C1H_ex_err_6  = 0.000485153 # 41 °C
FM1_C1H_sx_6  =     2.45604; FM1_C1H_sx_err_6  =    0.030143 # 41 °C
FM1_C1H_ab_6  =     6.16543; FM1_C1H_ab_err_6  =    0.138389 # 41 °C
FM1_C1H_ba_6  =   0.0605326; FM1_C1H_ba_err_6  =    0.144493 # 41 °C
FM1_C1H_bs_6  =     3.13824; FM1_C1H_bs_err_6  =     1.12138 # 41 °C
FM1_C1H_bca_6 =     85.6655; FM1_C1H_bca_err_6 =    0.821411 # 41 °C
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FM1_C1H_bcs_6 =     126.757; FM1_C1H_bcs_err_6 =    0.873542 # 41 °C
FM1_C1H_ac_6  =     43.5669; FM1_C1H_ac_err_6  =     1.27696 # 41 °C
FM1_C1H_ec_6  =    0.615993; FM1_C1H_ec_err_6  = 0.00145774 # 41 °C
FM1_C1H_sc_6  =     7.55664; FM1_C1H_sc_err_6  =     1.10977 # 41 °C
FM1_C1H_ax_7  =     4.27094; FM1_C1H_ax_err_7  =    0.107492 # 46 °C
FM1_C1H_ex_7  =    0.615937; FM1_C1H_ex_err_7  = 0.00128737 # 46 °C
FM1_C1H_sx_7  =     2.90036; FM1_C1H_sx_err_7  =   0.0813691 # 46 °C
FM1_C1H_ab_7  =     1.35462; FM1_C1H_ab_err_7  =   0.0923104 # 46 °C
FM1_C1H_ba_7  =    0.462352; FM1_C1H_ba_err_7  =    0.941236 # 46 °C
FM1_C1H_bs_7  =     5.56713; FM1_C1H_bs_err_7  =     3.11316 # 46 °C
FM1_C1H_bca_7 =     19.5397; FM1_C1H_bca_err_7 =    0.335852 # 46 °C
FM1_C1H_bcs_7 =     125.934; FM1_C1H_bcs_err_7 =     1.77769 # 46 °C
FM1_C1H_ac_7  =     11.0774; FM1_C1H_ac_err_7  =      0.5878 # 46 °C
FM1_C1H_ec_7  =    0.617561; FM1_C1H_ec_err_7  = 0.00210833 # 46 °C
FM1_C1H_sc_7  =     4.60422; FM1_C1H_sc_err_7  =     1.61942 # 46 °C
FM1_C1H_ee0   =    0.610548; FM1_C1H_ee0_err   = 0.000265366
FM1_C1H_ee1   = 0.000695399; FM1_C1H_ee1_err   = 1.3852e-05
FM1_C1H_ee2   = -1.31408e-05; FM1_C1H_ee2_err  = 5.38556e-07
FM1_BB_C_e_1  =     1125.96; FM1_BB_C_e_err_1  =     24.7818 # -17 °C
FM1_BB_C_a_1  =     28.5258; FM1_BB_C_a_err_1  =     5.22616 # -17 °C
FM1_BB_C_s_1  =     87.7328; FM1_BB_C_s_err_1  =     17.7096 # -17 °C
FM1_BB_C_e_2  =     1062.45; FM1_BB_C_e_err_2  =     19.3851 # -9 °C
FM1_BB_C_a_2  =     37.2051; FM1_BB_C_a_err_2  =     5.58173 # -9 °C
FM1_BB_C_s_2  =     85.7765; FM1_BB_C_s_err_2  =     13.8918 # -9 °C
FM1_BB_C_e_3  =     926.748; FM1_BB_C_e_err_3  =     13.2675 # +6 °C
FM1_BB_C_a_3  =     52.7799; FM1_BB_C_a_err_3  =     6.64743 # +6 °C
FM1_BB_C_s_3  =     72.4583; FM1_BB_C_s_err_3  =     9.53715 # +6 °C
FM1_BB_C_e_4  =      846.16; FM1_BB_C_e_err_4  =     12.4636 # 19 °C
FM1_BB_C_a_4  =     57.7116; FM1_BB_C_a_err_4  =     6.70659 # 19 °C
FM1_BB_C_s_4  =     73.0673; FM1_BB_C_s_err_4  =     8.78943 # 19 °C
FM1_BB_C_e_5  =     847.944; FM1_BB_C_e_err_5  =     12.6691 # 30 °C
FM1_BB_C_a_5  =     55.3677; FM1_BB_C_a_err_5  =       6.711 # 30 °C
FM1_BB_C_s_5  =     70.7656; FM1_BB_C_s_err_5  =     8.88941 # 30 °C
FM1_BB_C_e_6  =     686.342; FM1_BB_C_e_err_6  =     7.65902 # 41 °C
FM1_BB_C_a_6  =      89.217; FM1_BB_C_a_err_6  =     8.85587 # 41 °C
FM1_BB_C_s_6  =     54.2399; FM1_BB_C_s_err_6  =     5.33196 # 41 °C
FM1_BB_C_e_7  =     655.578; FM1_BB_C_e_err_7  =     16.7386 # 46 °C
FM1_BB_C_a_7  =     27.5822; FM1_BB_C_a_err_7  =     7.90299 # 46 °C
FM1_BB_C_s_7  =      38.826; FM1_BB_C_s_err_7  =     12.2931 # 46 °C
GPFUN_FM1_BGO_cal="FM1_BGO_cal(T) = FM1_BGO_BB0*(1-T*(FM1_BGO_BB1+T*(FM1_BGO_BB2/1e4)))"
FM1_BGO_BB0 =     986.452 ; FM1_BGO_BB0_err =     8.88082
FM1_BGO_BB1 = 0.00786924 ; FM1_BGO_BB1_err = 0.000678067
FM1_BGO_BB2 =   -0.130968 ; FM1_BGO_BB2_err =     0.16816
FM1_ABBA_C_a =     54.5259; FM1_ABBA_C_a_err =     8.28895
FM1_ABBA_C_e =   0.0532339; FM1_ABBA_C_e_err = 0.000676682
FM1_ABBA_C_s =     57.0842; FM1_ABBA_C_s_err =     7.67291
FM1_C2H_C1H_ratio_1  =      1.0015; FM1_C2H_C1H_ratio_err_1  = 4.44091e-09 # -17 °C
FM1_C2H_C1H_ratio_2  =     1.01232; FM1_C2H_C1H_ratio_err_2  = 4.71916e-09 # -9 °C
FM1_C2H_C1H_ratio_3  =     1.00305; FM1_C2H_C1H_ratio_err_3  = 4.9983e-09 # +6 °C
FM1_C2H_C1H_ratio_4  =    0.998911; FM1_C2H_C1H_ratio_err_4  = 5.56346e-09 # 19 °C
FM1_C2H_C1H_ratio_5  =      1.0299; FM1_C2H_C1H_ratio_err_5  = 6.55786e-09 # 30 °C
FM1_C2H_C1H_ratio_6  =    0.999594; FM1_C2H_C1H_ratio_err_6  = 6.90035e-09 # 41 °C
FM1_C2H_C1H_ratio_7  =     1.02958; FM1_C2H_C1H_ratio_err_7  = 1.60799e-08 # 46 °C
FM1_C1L_ratio_1  =     13.5913; FM1_C1L_ratio_err_1  = 1.91877e-07 # -17 °C
FM1_C1L_ratio_2  =     13.7174; FM1_C1L_ratio_err_2  = 1.52872e-07 # -9 °C
FM1_C1L_ratio_3  =     13.9414; FM1_C1L_ratio_err_3  = 3.24599e-07 # +6 °C
FM1_C1L_ratio_4  =     14.0408; FM1_C1L_ratio_err_4  = 3.99422e-07 # 19 °C
FM1_C1L_ratio_5  =     13.9778; FM1_C1L_ratio_err_5  = 2.48601e-07 # 30 °C
FM1_C1L_ratio_6  =     13.9676; FM1_C1L_ratio_err_6  = 2.96981e-07 # 41 °C
FM1_C1L_ratio_7  =     13.8473; FM1_C1L_ratio_err_7  = 3.69429e-06 # 46 °C
FM1_C2L_ratio_1  =     13.7091; FM1_C2L_ratio_err_1  = 1.84181e-07 # -17 °C
FM1_C2L_ratio_2  =     13.8435; FM1_C2L_ratio_err_2  = 1.70038e-07 # -9 °C
FM1_C2L_ratio_3  =     14.0877; FM1_C2L_ratio_err_3  = 3.51302e-07 # +6 °C
FM1_C2L_ratio_4  =     14.1692; FM1_C2L_ratio_err_4  = 4.4561e-07 # 19 °C
FM1_C2L_ratio_5  =     14.1372; FM1_C2L_ratio_err_5  = 1.69327e-07 # 30 °C
FM1_C2L_ratio_6  =     14.0528; FM1_C2L_ratio_err_6  = 2.99268e-07 # 41 °C
FM1_C2L_ratio_7  =     13.9186; FM1_C2L_ratio_err_7  = 3.3884e-06 # 46 °C
GPFUN_FM1_BGO_HL_cal="FM1_BGO_HL_cal(T) = FM1_BGO_HL0*(1 + T*(FM1_BGO_HL1 + T*(
    FM1_BGO_HL2)))"
FM1_BGO_HL0 =     13.9269 ; FM1_BGO_HL0_err = 1.15323e-07
FM1_BGO_HL1 = 0.000914998 ; FM1_BGO_HL1_err = 4.24091e-10
FM1_BGO_HL2 = -1.82276e-05 ; FM1_BGO_HL2_err = 1.79318e-11
FM1_A11H_ax_1  =     26.3145; FM1_A11H_ax_err_1  =    0.792523 # -17 °C 1
FM1_A11H_ex_1  =   0.0738979; FM1_A11H_ex_err_1  = 0.000149151 # -17 °C 1
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724  FM1_A11H_sx_1  =    0.314729; FM1_A11H_sx_err_1  = 0.00984461 # -17 °C 1
725  FM1_A11H_ba_1  =     783.145; FM1_A11H_ba_err_1  =     10.0639 # -17 °C 1
726  FM1_A11H_bs_1  =      10.453; FM1_A11H_bs_err_1  =    0.756331 # -17 °C 1
727  FM1_A11H_ax_2  =     29.8516; FM1_A11H_ax_err_2  =    0.845903 # -9 °C 1
728  FM1_A11H_ex_2  =  0.0750837; FM1_A11H_ex_err_2  = 0.000132028 # -9 °C 1
729  FM1_A11H_sx_2  =    0.295569; FM1_A11H_sx_err_2  = 0.00852153 # -9 °C 1
730  FM1_A11H_ba_2  =     848.261; FM1_A11H_ba_err_2  =      10.388 # -9 °C 1
731  FM1_A11H_bs_2  =     9.73557; FM1_A11H_bs_err_2  =    0.619035 # -9 °C 1
732  FM1_A11H_ax_3  =     23.8529; FM1_A11H_ax_err_3  =    0.640148 # +6 °C 1
733  FM1_A11H_ex_3  =  0.0778759; FM1_A11H_ex_err_3  = 0.000219218 # +6 °C 1
734  FM1_A11H_sx_3  =    0.526792; FM1_A11H_sx_err_3  =   0.0188315 # +6 °C 1
735  FM1_A11H_ba_3  =     1031.91; FM1_A11H_ba_err_3  =     16.0546 # +6 °C 1
736  FM1_A11H_bs_3  =     9.04152; FM1_A11H_bs_err_3  =    0.574858 # +6 °C 1
737  FM1_A11H_ax_4  =       25.83; FM1_A11H_ax_err_4  =    0.694534 # 19 °C 1
738  FM1_A11H_ex_4  =  0.0769856; FM1_A11H_ex_err_4  = 0.000199184 # 19 °C 1
739  FM1_A11H_sx_4  =    0.485043; FM1_A11H_sx_err_4  =   0.0164548 # 19 °C 1
740  FM1_A11H_ba_4  =     1054.31; FM1_A11H_ba_err_4  =     14.4328 # 19 °C 1
741  FM1_A11H_bs_4  =     9.78644; FM1_A11H_bs_err_4  =    0.623549 # 19 °C 1
742  FM1_A11H_ax_5  =     23.6016; FM1_A11H_ax_err_5  =    0.605725 # 30 °C 1
743  FM1_A11H_ex_5  =  0.0771235; FM1_A11H_ex_err_5  = 0.000227253 # 30 °C 1
744  FM1_A11H_sx_5  =    0.563155; FM1_A11H_sx_err_5  =    0.019684 # 30 °C 1
745  FM1_A11H_ba_5  =     1053.89; FM1_A11H_ba_err_5  =     16.5054 # 30 °C 1
746  FM1_A11H_bs_5  =     10.2671; FM1_A11H_bs_err_5  =    0.736508 # 30 °C 1
747  FM1_A11H_ax_6  =     29.4175; FM1_A11H_ax_err_6  =    0.709388 # 41 °C 1
748  FM1_A11H_ex_6  =  0.0785008; FM1_A11H_ex_err_6  = 0.000198613 # 41 °C 1
749  FM1_A11H_sx_6  =     0.52732; FM1_A11H_sx_err_6  =   0.0169544 # 41 °C 1
750  FM1_A11H_ba_6  =     1269.98; FM1_A11H_ba_err_6  =     18.2925 # 41 °C 1
751  FM1_A11H_bs_6  =      9.7893; FM1_A11H_bs_err_6  =     0.62001 # 41 °C 1
752  FM1_A11H_ax_7  =     8.44232; FM1_A11H_ax_err_7  =     0.42909 # 46 °C 1
753  FM1_A11H_ex_7  =  0.0768884; FM1_A11H_ex_err_7  = 0.000307585 # 46 °C 1
754  FM1_A11H_sx_7  =    0.398304; FM1_A11H_sx_err_7  =   0.0231311 # 46 °C 1
755  FM1_A11H_ba_7  =     302.094; FM1_A11H_ba_err_7  =     6.82834 # 46 °C 1
756  FM1_A11H_bs_7  =      10.504; FM1_A11H_bs_err_7  =     1.25228 # 46 °C 1
757  FM1_A12H_ax_1  =     72.0434; FM1_A12H_ax_err_1  =     1.28565 # -17 °C 2
758  FM1_A12H_ex_1  =  0.0724282; FM1_A12H_ex_err_1  = 0.000113442 # -17 °C 2
759  FM1_A12H_sx_1  =    0.419282; FM1_A12H_sx_err_1  = 0.00885157 # -17 °C 2
760  FM1_A12H_ba_1  =     3170.88; FM1_A12H_ba_err_1  =      21.561 # -17 °C 2
761  FM1_A12H_bs_1  =     10.6179; FM1_A12H_bs_err_1  =    0.396109 # -17 °C 2
762  FM1_A12H_ax_2  =     130.548; FM1_A12H_ax_err_2  =     1.86146 # -9 °C 2
763  FM1_A12H_ex_2  =  0.0777393; FM1_A12H_ex_err_2  = 4.84905e-05 # -9 °C 2
764  FM1_A12H_sx_2  =     0.23003; FM1_A12H_sx_err_2  = 0.00319651 # -9 °C 2
765  FM1_A12H_ba_2  =     3198.34; FM1_A12H_ba_err_2  =      20.097 # -9 °C 2
766  FM1_A12H_bs_2  =       11.08; FM1_A12H_bs_err_2  =    0.406861 # -9 °C 2
767  FM1_A12H_ax_3  =     107.223; FM1_A12H_ax_err_3  =     1.56847 # +6 °C 2
768  FM1_A12H_ex_3  =  0.0751211; FM1_A12H_ex_err_3  = 8.77276e-05 # +6 °C 2
769  FM1_A12H_sx_3  =    0.392153; FM1_A12H_sx_err_3  = 0.00653962 # +6 °C 2
770  FM1_A12H_ba_3  =     4093.56; FM1_A12H_ba_err_3  =      24.178 # +6 °C 2
771  FM1_A12H_bs_3  =     11.4265; FM1_A12H_bs_err_3  =    0.399082 # +6 °C 2
772  FM1_A12H_ax_4  =     110.848; FM1_A12H_ax_err_4  =     1.64023 # 19 °C 2
773  FM1_A12H_ex_4  =  0.0789631; FM1_A12H_ex_err_4  = 8.18553e-05 # 19 °C 2
774  FM1_A12H_sx_4  =    0.368409; FM1_A12H_sx_err_4  = 0.00605908 # 19 °C 2
775  FM1_A12H_ba_4  =     4140.34; FM1_A12H_ba_err_4  =     26.3737 # 19 °C 2
776  FM1_A12H_bs_4  =     9.47986; FM1_A12H_bs_err_4  =    0.280324 # 19 °C 2
777  FM1_A12H_ax_5  =     97.5665; FM1_A12H_ax_err_5  =     1.50707 # 30 °C 2
778  FM1_A12H_ex_5  =    0.075487; FM1_A12H_ex_err_5  = 9.70253e-05 # 30 °C 2
779  FM1_A12H_sx_5  =    0.414721; FM1_A12H_sx_err_5  = 0.00753111 # 30 °C 2
780  FM1_A12H_ba_5  =     4236.56; FM1_A12H_ba_err_5  =     25.1343 # 30 °C 2
781  FM1_A12H_bs_5  =     11.0451; FM1_A12H_bs_err_5  =    0.367237 # 30 °C 2
782  FM1_A12H_ax_6  =     153.231; FM1_A12H_ax_err_6  =     1.95201 # 41 °C 2
783  FM1_A12H_ex_6  =  0.0788292; FM1_A12H_ex_err_6  = 5.89611e-05 # 41 °C 2
784  FM1_A12H_sx_6  =    0.301826; FM1_A12H_sx_err_6  = 0.00395822 # 41 °C 2
785  FM1_A12H_ba_6  =     4940.37; FM1_A12H_ba_err_6  =     26.8167 # 41 °C 2
786  FM1_A12H_bs_6  =     10.0325; FM1_A12H_bs_err_6  =    0.275101 # 41 °C 2
787  FM1_A12H_ax_7  =     33.4097; FM1_A12H_ax_err_7  =    0.922611 # 46 °C 2
788  FM1_A12H_ex_7  =  0.0785829; FM1_A12H_ex_err_7  = 0.000135239 # 46 °C 2
789  FM1_A12H_sx_7  =    0.319346; FM1_A12H_sx_err_7  = 0.00929084 # 46 °C 2
790  FM1_A12H_ba_7  =     1202.66; FM1_A12H_ba_err_7  =      13.171 # 46 °C 2
791  FM1_A12H_bs_7  =     11.5691; FM1_A12H_bs_err_7  =     0.74092 # 46 °C 2
792  FM1_A21H_ax_1  =     6.07585; FM1_A21H_ax_err_1  =    0.408361 # -17 °C 3
793  FM1_A21H_ex_1  =  0.0771278; FM1_A21H_ex_err_1  = 0.000320956 # -17 °C 3
794  FM1_A21H_sx_1  =     0.31253; FM1_A21H_sx_err_1  =   0.0222881 # -17 °C 3
795  FM1_A21H_ba_1  =     230.108; FM1_A21H_ba_err_1  =     5.56043 # -17 °C 3
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796  FM1_A21H_bs_1  =    12.1869; FM1_A21H_bs_err_1  =    1.87046 # -17 °C 3
797  FM1_A21H_ax_2  =    6.21801; FM1_A21H_ax_err_2  =    0.39448 # -9 °C 3
798  FM1_A21H_ex_2  =  0.0747643; FM1_A21H_ex_err_2  = 0.000350532 # -9 °C 3
799  FM1_A21H_sx_2  =   0.358459; FM1_A21H_sx_err_2  =   0.0248811 # -9 °C 3
800  FM1_A21H_ba_2  =    239.843; FM1_A21H_ba_err_2  =    5.66347 # -9 °C 3
801  FM1_A21H_bs_2  =    14.3864; FM1_A21H_bs_err_2  =    2.58243 # -9 °C 3
802  FM1_A21H_ax_3  =    5.56427; FM1_A21H_ax_err_3  =   0.332243 # +6 °C 3
803  FM1_A21H_ex_3  =  0.0784225; FM1_A21H_ex_err_3  = 0.000493807 # +6 °C 3
804  FM1_A21H_sx_3  =   0.525628; FM1_A21H_sx_err_3  =   0.042531 # +6 °C 3
805  FM1_A21H_ba_3  =    307.694; FM1_A21H_ba_err_3  =    8.83765 # +6 °C 3
806  FM1_A21H_bs_3  =    11.4091; FM1_A21H_bs_err_3  =    1.68895 # +6 °C 3
807  FM1_A21H_ax_4  =    10.2108; FM1_A21H_ax_err_4  =   0.533008 # 19 °C 3
808  FM1_A21H_ex_4  =  0.0771928; FM1_A21H_ex_err_4  = 0.000201333 # 19 °C 3
809  FM1_A21H_sx_4  =   0.261001; FM1_A21H_sx_err_4  =   0.0135359 # 19 °C 3
810  FM1_A21H_ba_4  =    302.437; FM1_A21H_ba_err_4  =    6.15755 # 19 °C 3
811  FM1_A21H_bs_4  =    20.4173; FM1_A21H_bs_err_4  =    4.53495 # 19 °C 3
812  FM1_A21H_ax_5  =    7.81104; FM1_A21H_ax_err_5  =   0.467086 # 30 °C 3
813  FM1_A21H_ex_5  =  0.0811788; FM1_A21H_ex_err_5  = 0.000288048 # 30 °C 3
814  FM1_A21H_sx_5  =   0.313509; FM1_A21H_sx_err_5  =   0.0196592 # 30 °C 3
815  FM1_A21H_ba_5  =    321.036; FM1_A21H_ba_err_5  =    7.42862 # 30 °C 3
816  FM1_A21H_bs_5  =    12.5542; FM1_A21H_bs_err_5  =    1.77493 # 30 °C 3
817  FM1_A21H_ax_6  =    6.31972; FM1_A21H_ax_err_6  =   0.371047 # 41 °C 3
818  FM1_A21H_ex_6  =  0.0785777; FM1_A21H_ex_err_6  = 0.000478805 # 41 °C 3
819  FM1_A21H_sx_6  =   0.510522; FM1_A21H_sx_err_6  =   0.0401195 # 41 °C 3
820  FM1_A21H_ba_6  =    392.715; FM1_A21H_ba_err_6  =    9.49746 # 41 °C 3
821  FM1_A21H_bs_6  =    16.2842; FM1_A21H_bs_err_6  =    2.96434 # 41 °C 3
822  FM1_A21H_ax_7  =     1.8748; FM1_A21H_ax_err_7  =   0.224713 # 46 °C 3
823  FM1_A21H_ex_7  =  0.0778891; FM1_A21H_ex_err_7  = 0.000710292 # 46 °C 3
824  FM1_A21H_sx_7  =   0.388194; FM1_A21H_sx_err_7  =   0.053526 # 46 °C 3
825  FM1_A21H_ba_7  =    91.4816; FM1_A21H_ba_err_7  =     3.7927 # 46 °C 3
826  FM1_A21H_bs_7  =    12.8352; FM1_A21H_bs_err_7  =    3.42542 # 46 °C 3
827  FM1_A22H_ax_1  =    19.9226; FM1_A22H_ax_err_1  =   0.706718 # -17 °C 4
828  FM1_A22H_ex_1  =  0.0721727; FM1_A22H_ex_err_1  = 0.000213237 # -17 °C 4
829  FM1_A22H_sx_1  =   0.392312; FM1_A22H_sx_err_1  =   0.0160976 # -17 °C 4
830  FM1_A22H_ba_1  =    906.961; FM1_A22H_ba_err_1  =    11.2916 # -17 °C 4
831  FM1_A22H_bs_1  =    11.4569; FM1_A22H_bs_err_1  =   0.858398 # -17 °C 4
832  FM1_A22H_ax_2  =    16.8874; FM1_A22H_ax_err_2  =   0.596403 # -9 °C 4
833  FM1_A22H_ex_2  =  0.0740488; FM1_A22H_ex_err_2  = 0.000277338 # -9 °C 4
834  FM1_A22H_sx_2  =   0.499392; FM1_A22H_sx_err_2  =   0.0227855 # -9 °C 4
835  FM1_A22H_ba_2  =    997.221; FM1_A22H_ba_err_2  =    13.2601 # -9 °C 4
836  FM1_A22H_bs_2  =    11.1946; FM1_A22H_bs_err_2  =   0.808715 # -9 °C 4
837  FM1_A22H_ax_3  =    23.7305; FM1_A22H_ax_err_3  =    0.72332 # +6 °C 4
838  FM1_A22H_ex_3  =  0.0751157; FM1_A22H_ex_err_3  = 0.000213384 # +6 °C 4
839  FM1_A22H_sx_3  =   0.457215; FM1_A22H_sx_err_3  =   0.0171573 # +6 °C 4
840  FM1_A22H_ba_3  =    1165.48; FM1_A22H_ba_err_3  =    13.7642 # +6 °C 4
841  FM1_A22H_bs_3  =    11.2992; FM1_A22H_bs_err_3  =    0.75221 # +6 °C 4
842  FM1_A22H_ax_4  =    21.9573; FM1_A22H_ax_err_4  =   0.624952 # 19 °C 4
843  FM1_A22H_ex_4  =  0.0760323; FM1_A22H_ex_err_4  = 0.000246616 # 19 °C 4
844  FM1_A22H_sx_4  =   0.548178; FM1_A22H_sx_err_4  =   0.0210559 # 19 °C 4
845  FM1_A22H_ba_4  =    1192.36; FM1_A22H_ba_err_4  =    16.2009 # 19 °C 4
846  FM1_A22H_bs_4  =    11.2316; FM1_A22H_bs_err_4  =   0.788528 # 19 °C 4
847  FM1_A22H_ax_5  =    27.5268; FM1_A22H_ax_err_5  =   0.807065 # 30 °C 4
848  FM1_A22H_ex_5  =  0.0784153; FM1_A22H_ex_err_5  = 0.000182751 # 30 °C 4
849  FM1_A22H_sx_5  =   0.415782; FM1_A22H_sx_err_5  =   0.0143891 # 30 °C 4
850  FM1_A22H_ba_5  =    1164.64; FM1_A22H_ba_err_5  =    14.4127 # 30 °C 4
851  FM1_A22H_bs_5  =    10.7796; FM1_A22H_bs_err_5  =   0.701423 # 30 °C 4
852  FM1_A22H_ax_6  =    38.7046; FM1_A22H_ax_err_6  =    1.03556 # 41 °C 4
853  FM1_A22H_ex_6  =  0.0770352; FM1_A22H_ex_err_6  = 0.000122509 # 41 °C 4
854  FM1_A22H_sx_6  =    0.29749; FM1_A22H_sx_err_6  = 0.00829567 # 41 °C 4
855  FM1_A22H_ba_6  =     1453.9; FM1_A22H_ba_err_6  =    13.7029 # 41 °C 4
856  FM1_A22H_bs_6  =    14.0332; FM1_A22H_bs_err_6  =   0.976197 # 41 °C 4
857  FM1_A22H_ax_7  =    8.94767; FM1_A22H_ax_err_7  =   0.494952 # 46 °C 4
858  FM1_A22H_ex_7  =  0.0787832; FM1_A22H_ex_err_7  = 0.000253286 # 46 °C 4
859  FM1_A22H_sx_7  =   0.296788; FM1_A22H_sx_err_7  =   0.0170541 # 46 °C 4
860  FM1_A22H_ba_7  =    344.076; FM1_A22H_ba_err_7  =    6.94722 # 46 °C 4
861  FM1_A22H_bs_7  =    13.4563; FM1_A22H_bs_err_7  =    1.86895 # 46 °C 4
862  FM1_B11H_ax_1  =    35.7958; FM1_B11H_ax_err_1  =   0.883974 # -17 °C 5
863  FM1_B11H_ex_1  =  0.0748114; FM1_B11H_ex_err_1  = 0.000124439 # -17 °C 5
864  FM1_B11H_sx_1  =   0.333181; FM1_B11H_sx_err_1  = 0.00854255 # -17 °C 5
865  FM1_B11H_ba_1  =    869.804; FM1_B11H_ba_err_1  =    10.8002 # -17 °C 5
866  FM1_B11H_bs_1  =    15.7838; FM1_B11H_bs_err_1  =    1.65178 # -17 °C 5
867  FM1_B11H_ax_2  =    37.5677; FM1_B11H_ax_err_2  =   0.900932 # -9 °C 5
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FM1_B11H_ex_2  =  0.0786509; FM1_B11H_ex_err_2  = 0.000121443 # -9 °C 5
FM1_B11H_sx_2  =   0.334907; FM1_B11H_sx_err_2  = 0.00832341 # -9 °C 5
FM1_B11H_ba_2  =     939.695; FM1_B11H_ba_err_2  =     12.0669 # -9 °C 5
FM1_B11H_bs_2  =     12.2547; FM1_B11H_bs_err_2  =     0.97883 # -9 °C 5
FM1_B11H_ax_3  =     55.6641; FM1_B11H_ax_err_3  =     1.08232 # +6 °C 5
FM1_B11H_ex_3  =  0.0800102; FM1_B11H_ex_err_3  = 8.36737e-05 # +6 °C 5
FM1_B11H_sx_3  =   0.283536; FM1_B11H_sx_err_3  = 0.00531411 # +6 °C 5
FM1_B11H_ba_3  =     1102.76; FM1_B11H_ba_err_3  =     12.9906 # +6 °C 5
FM1_B11H_bs_3  =      20.933; FM1_B11H_bs_err_3  =     2.60702 # +6 °C 5
FM1_B11H_ax_4  =       46.77; FM1_B11H_ax_err_4  =     1.00707 # 19 °C 5
FM1_B11H_ex_4  =  0.0781378; FM1_B11H_ex_err_4  = 0.000108392 # 19 °C 5
FM1_B11H_sx_4  =   0.334897; FM1_B11H_sx_err_4  = 0.00748272 # 19 °C 5
FM1_B11H_ba_4  =     1157.85; FM1_B11H_ba_err_4  =     12.9876 # 19 °C 5
FM1_B11H_bs_4  =     18.2084; FM1_B11H_bs_err_4  =     1.92554 # 19 °C 5
FM1_B11H_ax_5  =     39.1491; FM1_B11H_ax_err_5  =    0.850482 # 30 °C 5
FM1_B11H_ex_5  =  0.0818781; FM1_B11H_ex_err_5  = 0.00014716 # 30 °C 5
FM1_B11H_sx_5  =     0.44797; FM1_B11H_sx_err_5  =   0.0117354 # 30 °C 5
FM1_B11H_ba_5  =     1150.54; FM1_B11H_ba_err_5  =     18.2627 # 30 °C 5
FM1_B11H_bs_5  =     11.4354; FM1_B11H_bs_err_5  =    0.932377 # 30 °C 5
FM1_B11H_ax_6  =     62.6841; FM1_B11H_ax_err_6  =     1.16049 # 41 °C 5
FM1_B11H_ex_6  =  0.0790771; FM1_B11H_ex_err_6  = 8.54308e-05 # 41 °C 5
FM1_B11H_sx_6  =   0.305194; FM1_B11H_sx_err_6  = 0.00560444 # 41 °C 5
FM1_B11H_ba_6  =     1383.47; FM1_B11H_ba_err_6  =     14.2799 # 41 °C 5
FM1_B11H_bs_6  =     21.6532; FM1_B11H_bs_err_6  =     2.49008 # 41 °C 5
FM1_B11H_ax_7  =      14.552; FM1_B11H_ax_err_7  =    0.552532 # 46 °C 5
FM1_B11H_ex_7  =  0.0806649; FM1_B11H_ex_err_7  = 0.000186542 # 46 °C 5
FM1_B11H_sx_7  =   0.324674; FM1_B11H_sx_err_7  =   0.0126313 # 46 °C 5
FM1_B11H_ba_7  =     330.455; FM1_B11H_ba_err_7  =     7.53408 # 46 °C 5
FM1_B11H_bs_7  =     21.9638; FM1_B11H_bs_err_7  =     5.43365 # 46 °C 5
FM1_B12H_ax_1  =     138.303; FM1_B12H_ax_err_1  =     1.74378 # -17 °C 6
FM1_B12H_ex_1  =   0.075353; FM1_B12H_ex_err_1  = 6.04492e-05 # -17 °C 6
FM1_B12H_sx_1  =      0.3149; FM1_B12H_sx_err_1  = 0.00400717 # -17 °C 6
FM1_B12H_ba_1  =     3172.15; FM1_B12H_ba_err_1  =      20.517 # -17 °C 6
FM1_B12H_bs_1  =     14.6795; FM1_B12H_bs_err_1  =    0.745049 # -17 °C 6
FM1_B12H_ax_2  =     138.378; FM1_B12H_ax_err_2  =     1.74369 # -9 °C 6
FM1_B12H_ex_2  =  0.0758717; FM1_B12H_ex_err_2  = 6.46293e-05 # -9 °C 6
FM1_B12H_sx_2  =   0.339517; FM1_B12H_sx_err_2  = 0.00447499 # -9 °C 6
FM1_B12H_ba_2  =     3483.67; FM1_B12H_ba_err_2  =     21.8234 # -9 °C 6
FM1_B12H_bs_2  =      17.881; FM1_B12H_bs_err_2  =     1.06432 # -9 °C 6
FM1_B12H_ax_3  =     122.494; FM1_B12H_ax_err_3  =     1.44984 # +6 °C 6
FM1_B12H_ex_3  =  0.0778128; FM1_B12H_ex_err_3  = 8.79886e-05 # +6 °C 6
FM1_B12H_sx_3  =   0.488401; FM1_B12H_sx_err_3  = 0.00725205 # +6 °C 6
FM1_B12H_ba_3  =     4164.92; FM1_B12H_ba_err_3  =     29.6575 # +6 °C 6
FM1_B12H_bs_3  =      11.943; FM1_B12H_bs_err_3  =    0.482216 # +6 °C 6
FM1_B12H_ax_4  =     165.587; FM1_B12H_ax_err_4  =      1.8963 # 19 °C 6
FM1_B12H_ex_4  =  0.0770431; FM1_B12H_ex_err_4  = 5.92541e-05 # 19 °C 6
FM1_B12H_sx_4  =   0.343915; FM1_B12H_sx_err_4  = 0.00415164 # 19 °C 6
FM1_B12H_ba_4  =     4278.34; FM1_B12H_ba_err_4  =     24.5122 # 19 °C 6
FM1_B12H_bs_4  =     19.0835; FM1_B12H_bs_err_4  =     1.09101 # 19 °C 6
FM1_B12H_ax_5  =      150.75; FM1_B12H_ax_err_5  =     1.77292 # 30 °C 6
FM1_B12H_ex_5  =   0.077289; FM1_B12H_ex_err_5  = 6.87949e-05 # 30 °C 6
FM1_B12H_sx_5  =   0.389617; FM1_B12H_sx_err_5  = 0.00509416 # 30 °C 6
FM1_B12H_ba_5  =     4421.92; FM1_B12H_ba_err_5  =     25.9625 # 30 °C 6
FM1_B12H_bs_5  =     17.5258; FM1_B12H_bs_err_5  =    0.923895 # 30 °C 6
FM1_B12H_ax_6  =     188.689; FM1_B12H_ax_err_6  =     2.03918 # 41 °C 6
FM1_B12H_ex_6  =  0.0771603; FM1_B12H_ex_err_6  = 5.80912e-05 # 41 °C 6
FM1_B12H_sx_6  =   0.355931; FM1_B12H_sx_err_6  = 0.00412692 # 41 °C 6
FM1_B12H_ba_6  =     5400.04; FM1_B12H_ba_err_6  =     27.6737 # 41 °C 6
FM1_B12H_bs_6  =     22.7318; FM1_B12H_bs_err_6  =     1.38082 # 41 °C 6
FM1_B12H_ax_7  =     48.1677; FM1_B12H_ax_err_7  =     1.02044 # 46 °C 6
FM1_B12H_ex_7  =  0.078612; FM1_B12H_ex_err_7  = 0.00010831 # 46 °C 6
FM1_B12H_sx_7  =     0.33702; FM1_B12H_sx_err_7  = 0.00745298 # 46 °C 6
FM1_B12H_ba_7  =     1233.82; FM1_B12H_ba_err_7  =     13.6472 # 46 °C 6
FM1_B12H_bs_7  =     17.6282; FM1_B12H_bs_err_7  =     1.75855 # 46 °C 6
FM1_A11H_ac_1  =     139.513; FM1_A11H_ac_err_1  =     67.5457 # -17 °C 1
FM1_A11H_ec_1  =  0.0734649; FM1_A11H_ec_err_1  = 0.00206462 # -17 °C 1
FM1_A11H_sc_1  =     4.34299; FM1_A11H_sc_err_1  =     1.44076 # -17 °C 1
FM1_A11H_bca_1 =       154.7; FM1_A11H_bca_err_1 =     18.8522 # -17 °C 1
FM1_A11H_bcs_1 =     21.1105; FM1_A11H_bcs_err_1 =     10.9618 # -17 °C 1
FM1_A11H_ac_2  =     66.3859; FM1_A11H_ac_err_2  =     14.3435 # -9 °C 1
FM1_A11H_ec_2  =  0.0770912; FM1_A11H_ec_err_2  = 0.000996066 # -9 °C 1
FM1_A11H_sc_2  =     2.36765; FM1_A11H_sc_err_2  =    0.827285 # -9 °C 1
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940  FM1_A11H_bca_2 =    145.083; FM1_A11H_bca_err_2 =    7.47157 # -9 °C 1
941  FM1_A11H_bcs_2 =    13.1046; FM1_A11H_bcs_err_2 =    1.10027 # -9 °C 1
942  FM1_A11H_ac_3  =    80.6464; FM1_A11H_ac_err_3  =    8.61446 # +6 °C 1
943  FM1_A11H_ec_3  =  0.0769413; FM1_A11H_ec_err_3  = 0.000365784 # +6 °C 1
944  FM1_A11H_sc_3  =   0.713001; FM1_A11H_sc_err_3  =   0.291598 # +6 °C 1
945  FM1_A11H_bca_3 =    198.497; FM1_A11H_bca_err_3 =    4.14881 # +6 °C 1
946  FM1_A11H_bcs_3 =    14.4624; FM1_A11H_bcs_err_3 =   0.760975 # +6 °C 1
947  FM1_A11H_ac_4  =    82.2078; FM1_A11H_ac_err_4  =    7.13965 # 19 °C 1
948  FM1_A11H_ec_4  =  0.0773707; FM1_A11H_ec_err_4  = 0.000210256 # 19 °C 1
949  FM1_A11H_sc_4  =   0.179979; FM1_A11H_sc_err_4  =   0.109413 # 19 °C 1
950  FM1_A11H_bca_4 =    198.424; FM1_A11H_bca_err_4 =    3.19513 # 19 °C 1
951  FM1_A11H_bcs_4 =    14.0494; FM1_A11H_bcs_err_4 =    0.62212 # 19 °C 1
952  FM1_A11H_ac_5  =    77.6479; FM1_A11H_ac_err_5  =    8.78677 # 30 °C 1
953  FM1_A11H_ec_5  =   0.078082; FM1_A11H_ec_err_5  = 0.000438943 # 30 °C 1
954  FM1_A11H_sc_5  =    0.90707; FM1_A11H_sc_err_5  =   0.341265 # 30 °C 1
955  FM1_A11H_bca_5 =    189.882; FM1_A11H_bca_err_5 =    4.65555 # 30 °C 1
956  FM1_A11H_bcs_5 =    14.0302; FM1_A11H_bcs_err_5 =   0.708615 # 30 °C 1
957  FM1_A11H_ac_6  =    95.5602; FM1_A11H_ac_err_6  =     12.325 # 41 °C 1
958  FM1_A11H_ec_6  =  0.0786908; FM1_A11H_ec_err_6  = 0.000610551 # 41 °C 1
959  FM1_A11H_sc_6  =    1.65391; FM1_A11H_sc_err_6  =   0.482418 # 41 °C 1
960  FM1_A11H_bca_6 =    220.014; FM1_A11H_bca_err_6 =    7.17769 # 41 °C 1
961  FM1_A11H_bcs_6 =    13.4832; FM1_A11H_bcs_err_6 =   0.683497 # 41 °C 1
962  FM1_A11H_ac_7  =     33.247; FM1_A11H_ac_err_7  =    7.17393 # 46 °C 1
963  FM1_A11H_ec_7  =  0.0799858; FM1_A11H_ec_err_7  = 0.00112786 # 46 °C 1
964  FM1_A11H_sc_7  =    2.07936; FM1_A11H_sc_err_7  =    0.88587 # 46 °C 1
965  FM1_A11H_bca_7 =    48.1437; FM1_A11H_bca_err_7 =    3.50819 # 46 °C 1
966  FM1_A11H_bcs_7 =    15.9893; FM1_A11H_bcs_err_7 =    2.06147 # 46 °C 1
967  FM1_A12H_ac_1  =    198.339; FM1_A12H_ac_err_1  =    15.0117 # -17 °C 2
968  FM1_A12H_ec_1  =  0.0745224; FM1_A12H_ec_err_1  = 0.000230071 # -17 °C 2
969  FM1_A12H_sc_1  =   0.659036; FM1_A12H_sc_err_1  =   0.188709 # -17 °C 2
970  FM1_A12H_bca_1 =    541.924; FM1_A12H_bca_err_1 =    6.97676 # -17 °C 2
971  FM1_A12H_bcs_1 =    12.6156; FM1_A12H_bcs_err_1 =   0.402887 # -17 °C 2
972  FM1_A12H_ac_2  =    241.017; FM1_A12H_ac_err_2  =    18.0024 # -9 °C 2
973  FM1_A12H_ec_2  =  0.0758768; FM1_A12H_ec_err_2  = 0.000284807 # -9 °C 2
974  FM1_A12H_sc_2  =    1.14214; FM1_A12H_sc_err_2  =   0.231464 # -9 °C 2
975  FM1_A12H_bca_2 =    589.956; FM1_A12H_bca_err_2 =    8.90643 # -9 °C 2
976  FM1_A12H_bcs_2 =    13.4623; FM1_A12H_bcs_err_2 =   0.453351 # -9 °C 2
977  FM1_A12H_ac_3  =     295.91; FM1_A12H_ac_err_3  =    20.2699 # +6 °C 2
978  FM1_A12H_ec_3  =  0.0775167; FM1_A12H_ec_err_3  = 0.000294297 # +6 °C 2
979  FM1_A12H_sc_3  =    1.36664; FM1_A12H_sc_err_3  =   0.234519 # +6 °C 2
980  FM1_A12H_bca_3 =    705.218; FM1_A12H_bca_err_3 =     10.896 # +6 °C 2
981  FM1_A12H_bcs_3 =    13.7844; FM1_A12H_bcs_err_3 =   0.407446 # +6 °C 2
982  FM1_A12H_ac_4  =    298.982; FM1_A12H_ac_err_4  =    22.1486 # 19 °C 2
983  FM1_A12H_ec_4  =   0.077706; FM1_A12H_ec_err_4  = 0.00032777 # 19 °C 2
984  FM1_A12H_sc_4  =    1.51168; FM1_A12H_sc_err_4  =   0.258709 # 19 °C 2
985  FM1_A12H_bca_4 =    751.878; FM1_A12H_bca_err_4 =     12.121 # 19 °C 2
986  FM1_A12H_bcs_4 =    14.4335; FM1_A12H_bcs_err_4 =   0.449624 # 19 °C 2
987  FM1_A12H_ac_5  =    284.623; FM1_A12H_ac_err_5  =    20.2503 # 30 °C 2
988  FM1_A12H_ec_5  =  0.0778974; FM1_A12H_ec_err_5  = 0.000306538 # 30 °C 2
989  FM1_A12H_sc_5  =    1.32985; FM1_A12H_sc_err_5  =   0.243691 # 30 °C 2
990  FM1_A12H_bca_5 =    736.671; FM1_A12H_bca_err_5 =    11.3445 # 30 °C 2
991  FM1_A12H_bcs_5 =    14.0796; FM1_A12H_bcs_err_5 =   0.405679 # 30 °C 2
992  FM1_A12H_ac_6  =    322.103; FM1_A12H_ac_err_6  =    17.0502 # 41 °C 2
993  FM1_A12H_ec_6  =   0.078518; FM1_A12H_ec_err_6  = 0.00018363 # 41 °C 2
994  FM1_A12H_sc_6  =   0.650692; FM1_A12H_sc_err_6  =   0.141648 # 41 °C 2
995  FM1_A12H_bca_6 =    872.695; FM1_A12H_bca_err_6 =    9.07695 # 41 °C 2
996  FM1_A12H_bcs_6 =    14.0811; FM1_A12H_bcs_err_6 =    0.30753 # 41 °C 2
997  FM1_A12H_ac_7  =    81.9256; FM1_A12H_ac_err_7  =    10.6117 # 46 °C 2
998  FM1_A12H_ec_7  =  0.0779516; FM1_A12H_ec_err_7  = 0.000563106 # 46 °C 2
999  FM1_A12H_sc_7  =    1.29545; FM1_A12H_sc_err_7  =   0.435469 # 46 °C 2
1000 FM1_A12H_bca_7 =    209.037; FM1_A12H_bca_err_7 =    5.89305 # 46 °C 2
1001 FM1_A12H_bcs_7 =    14.4714; FM1_A12H_bcs_err_7 =   0.793271 # 46 °C 2
1002 FM1_A21H_ac_1  =    10.1414; FM1_A21H_ac_err_1  =     3.4948 # -17 °C 3
1003 FM1_A21H_ec_1  =  0.0747527; FM1_A21H_ec_err_1  = 0.00138415 # -17 °C 3
1004 FM1_A21H_sc_1  =    1.28871; FM1_A21H_sc_err_1  =    1.07052 # -17 °C 3
1005 FM1_A21H_bca_1 =    18.5906; FM1_A21H_bca_err_1 =    1.79872 # -17 °C 3
1006 FM1_A21H_bcs_1 =    9.98773; FM1_A21H_bcs_err_1 =    1.46901 # -17 °C 3
1007 FM1_A21H_ac_2  =    16.5056; FM1_A21H_ac_err_2  =    2.52652 # -9 °C 3
1008 FM1_A21H_ec_2  =  0.0766685; FM1_A21H_ec_err_2  = 0.000516118 # -9 °C 3
1009 FM1_A21H_sc_2  =   0.619119; FM1_A21H_sc_err_2  =   0.416168 # -9 °C 3
1010 FM1_A21H_bca_2 =    18.1767; FM1_A21H_bca_err_2 =    1.13715 # -9 °C 3
1011 FM1_A21H_bcs_2 =     10.875; FM1_A21H_bcs_err_2 =    1.24857 # -9 °C 3
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FM1_A21H_ac_3  =    18.2447; FM1_A21H_ac_err_3  =    3.62266 # +6 °C 3
FM1_A21H_ec_3  =  0.0769188; FM1_A21H_ec_err_3  = 0.000865261 # +6 °C 3
FM1_A21H_sc_3  =     1.2218; FM1_A21H_sc_err_3  =   0.645248 # +6 °C 3
FM1_A21H_bca_3 =      25.04; FM1_A21H_bca_err_3 =     1.7878 # +6 °C 3
FM1_A21H_bcs_3 =    10.9275; FM1_A21H_bcs_err_3 =    1.23338 # +6 °C 3
FM1_A21H_ac_4  =    16.3178; FM1_A21H_ac_err_4  =    3.78187 # 19 °C 3
FM1_A21H_ec_4  =  0.0782745; FM1_A21H_ec_err_4  = 0.00109993 # 19 °C 3
FM1_A21H_sc_4  =    1.51745; FM1_A21H_sc_err_4  =   0.886797 # 19 °C 3
FM1_A21H_bca_4 =    24.3109; FM1_A21H_bca_err_4 =    2.07094 # 19 °C 3
FM1_A21H_bcs_4 =    10.4003; FM1_A21H_bcs_err_4 =    1.07965 # 19 °C 3
FM1_A21H_ac_5  =     26.564; FM1_A21H_ac_err_5  =    7.26526 # 30 °C 3
FM1_A21H_ec_5  =  0.0758316; FM1_A21H_ec_err_5  = 0.00129959 # 30 °C 3
FM1_A21H_sc_5  =    2.52744; FM1_A21H_sc_err_5  =     0.9793 # 30 °C 3
FM1_A21H_bca_5 =    28.3307; FM1_A21H_bca_err_5 =    2.84428 # 30 °C 3
FM1_A21H_bcs_5 =    13.9635; FM1_A21H_bcs_err_5 =    3.12539 # 30 °C 3
FM1_A21H_ac_6  =    20.0022; FM1_A21H_ac_err_6  =    3.01922 # 41 °C 3
FM1_A21H_ec_6  =  0.0769477; FM1_A21H_ec_err_6  = 0.000441929 # 41 °C 3
FM1_A21H_sc_6  =   0.173739; FM1_A21H_sc_err_6  =   0.487298 # 41 °C 3
FM1_A21H_bca_6 =    33.0224; FM1_A21H_bca_err_6 =    1.34937 # 41 °C 3
FM1_A21H_bcs_6 =    11.8435; FM1_A21H_bcs_err_6 =    1.05755 # 41 °C 3
FM1_A21H_ac_7  =    4.30785; FM1_A21H_ac_err_7  =    2.03121 # 46 °C 3
FM1_A21H_ec_7  =  0.0773611; FM1_A21H_ec_err_7  = 0.00207056 # 46 °C 3
FM1_A21H_sc_7  =    1.28819; FM1_A21H_sc_err_7  =    1.64473 # 46 °C 3
FM1_A21H_bca_7 =    6.66288; FM1_A21H_bca_err_7 =    1.08343 # 46 °C 3
FM1_A21H_bcs_7 =    10.3588; FM1_A21H_bcs_err_7 =    2.25705 # 46 °C 3
FM1_A22H_ac_1  =    43.6206; FM1_A22H_ac_err_1  = 3.06581e+06 # −17 °C 4
FM1_A22H_ec_1  =  0.0732444; FM1_A22H_ec_err_1  =    1727.75 # −17 °C 4
FM1_A22H_sc_1  =  0.0630787; FM1_A22H_sc_err_1  = 1.6618e+06 # −17 °C 4
FM1_A22H_bca_1 =     77.422; FM1_A22H_bca_err_1 = 5.44149e+06 # −17 °C 4
FM1_A22H_bcs_1 =    9.68288; FM1_A22H_bcs_err_1 =   0.549688 # −17 °C 4
FM1_A22H_ac_2  =    60.7765; FM1_A22H_ac_err_2  =    6.98338 # −9 °C 4
FM1_A22H_ec_2  =  0.0746525; FM1_A22H_ec_err_2  = 0.000434887 # −9 °C 4
FM1_A22H_sc_2  =    1.14145; FM1_A22H_sc_err_2  =   0.344388 # −9 °C 4
FM1_A22H_bca_2 =    84.6036; FM1_A22H_bca_err_2 =    3.04381 # −9 °C 4
FM1_A22H_bcs_2 =    11.0975; FM1_A22H_bcs_err_2 =   0.815886 # −9 °C 4
FM1_A22H_ac_3  =    51.6539; FM1_A22H_ac_err_3  =    5.54954 # +6 °C 4
FM1_A22H_ec_3  =  0.0758872; FM1_A22H_ec_err_3  = 0.00028711 # +6 °C 4
FM1_A22H_sc_3  =   0.386606; FM1_A22H_sc_err_3  =    0.22636 # +6 °C 4
FM1_A22H_bca_3 =     102.201; FM1_A22H_bca_err_3 =     2.5605 # +6 °C 4
FM1_A22H_bcs_3 =    10.1461; FM1_A22H_bcs_err_3 =   0.478372 # +6 °C 4
FM1_A22H_ac_4  =     101.95; FM1_A22H_ac_err_4  =    17.3423 # 19 °C 4
FM1_A22H_ec_4  =  0.0760879; FM1_A22H_ec_err_4  = 0.000806047 # 19 °C 4
FM1_A22H_sc_4  =    2.94368; FM1_A22H_sc_err_4  =     0.6219 # 19 °C 4
FM1_A22H_bca_4 =    107.878; FM1_A22H_bca_err_4 =    6.45032 # 19 °C 4
FM1_A22H_bcs_4 =    14.2234; FM1_A22H_bcs_err_4 =    1.89387 # 19 °C 4
FM1_A22H_ac_5  =    47.5023; FM1_A22H_ac_err_5  =    4.94285 # 30 °C 4
FM1_A22H_ec_5  =  0.0772434; FM1_A22H_ec_err_5  = 0.000242859 # 30 °C 4
FM1_A22H_sc_5  =   0.251972; FM1_A22H_sc_err_5  =   0.201298 # 30 °C 4
FM1_A22H_bca_5 =     98.252; FM1_A22H_bca_err_5 =    2.34866 # 30 °C 4
FM1_A22H_bcs_5 =    9.80501; FM1_A22H_bcs_err_5 =   0.396132 # 30 °C 4
FM1_A22H_ac_6  =    71.8051; FM1_A22H_ac_err_6  =    6.62414 # 41 °C 4
FM1_A22H_ec_6  =  0.0763722; FM1_A22H_ec_err_6  = 0.000313455 # 41 °C 4
FM1_A22H_sc_6  =   0.659276; FM1_A22H_sc_err_6  =   0.244094 # 41 °C 4
FM1_A22H_bca_6 =     125.566; FM1_A22H_bca_err_6 =    3.18756 # 41 °C 4
FM1_A22H_bcs_6 =    10.8898; FM1_A22H_bcs_err_6 =   0.509129 # 41 °C 4
FM1_A22H_ac_7  =    18.5523; FM1_A22H_ac_err_7  =    14.3322 # 46 °C 4
FM1_A22H_ec_7  =  0.0770555; FM1_A22H_ec_err_7  =  0.0204009 # 46 °C 4
FM1_A22H_sc_7  =   0.104355; FM1_A22H_sc_err_7  =    56.4169 # 46 °C 4
FM1_A22H_bca_7 =    28.0404; FM1_A22H_bca_err_7 =    20.3039 # 46 °C 4
FM1_A22H_bcs_7 =    11.2295; FM1_A22H_bcs_err_7 =    1.04141 # 46 °C 4
FM1_B11H_ac_1  =    84.4935; FM1_B11H_ac_err_1  =    13.4435 # −17 °C 5
FM1_B11H_ec_1  =  0.0771003; FM1_B11H_ec_err_1  = 0.000699434 # −17 °C 5
FM1_B11H_sc_1  =    1.85146; FM1_B11H_sc_err_1  =   0.568355 # −17 °C 5
FM1_B11H_bca_1 =    194.544; FM1_B11H_bca_err_1 =    6.27858 # −17 °C 5
FM1_B11H_bcs_1 =     16.849; FM1_B11H_bcs_err_1 =    1.42556 # −17 °C 5
FM1_B11H_ac_2  =    90.9523; FM1_B11H_ac_err_2  =    16.0405 # −9 °C 5
FM1_B11H_ec_2  =  0.0781933; FM1_B11H_ec_err_2  = 0.000837242 # −9 °C 5
FM1_B11H_sc_2  =    2.18354; FM1_B11H_sc_err_2  =   0.682559 # −9 °C 5
FM1_B11H_bca_2 =    215.619; FM1_B11H_bca_err_2 =    7.90981 # −9 °C 5
FM1_B11H_bcs_2 =    17.5825; FM1_B11H_bcs_err_2 =    1.49503 # −9 °C 5
FM1_B11H_ac_3  =    111.147; FM1_B11H_ac_err_3  =    10.5303 # +6 °C 5
FM1_B11H_ec_3  =   0.079499; FM1_B11H_ec_err_3  = 0.000398527 # +6 °C 5
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FM1_B11H_sc_3  =     1.06637; FM1_B11H_sc_err_3  =    0.311609 # +6 °C 5
FM1_B11H_bca_3 =     252.819; FM1_B11H_bca_err_3 =     5.41949 # +6 °C 5
FM1_B11H_bcs_3 =     17.1129; FM1_B11H_bcs_err_3 =    0.885628 # +6 °C 5
FM1_B11H_ac_4  =     137.534; FM1_B11H_ac_err_4  =     16.0799 # 19 °C 5
FM1_B11H_ec_4  =  0.0809849; FM1_B11H_ec_err_4  = 0.000606509 # 19 °C 5
FM1_B11H_sc_4  =     1.96952; FM1_B11H_sc_err_4  =    0.472899 # 19 °C 5
FM1_B11H_bca_4 =     245.469; FM1_B11H_bca_err_4 =     8.34455 # 19 °C 5
FM1_B11H_bcs_4 =     18.7365; FM1_B11H_bcs_err_4 =     1.19299 # 19 °C 5
FM1_B11H_ac_5  =     90.1431; FM1_B11H_ac_err_5  =     11.8472 # 30 °C 5
FM1_B11H_ec_5  =  0.0805832; FM1_B11H_ec_err_5  = 0.000612648 # 30 °C 5
FM1_B11H_sc_5  =      1.3508; FM1_B11H_sc_err_5  =    0.470151 # 30 °C 5
FM1_B11H_bca_5 =     254.699; FM1_B11H_bca_err_5 =     7.39928 # 30 °C 5
FM1_B11H_bcs_5 =     16.1162; FM1_B11H_bcs_err_5 =    0.778184 # 30 °C 5
FM1_B11H_ac_6  =     125.049; FM1_B11H_ac_err_6  =     9.10183 # 41 °C 5
FM1_B11H_ec_6  =  0.0792849; FM1_B11H_ec_err_6  = 0.000168385 # 41 °C 5
FM1_B11H_sc_6  =    0.254102; FM1_B11H_sc_err_6  =     0.14943 # 41 °C 5
FM1_B11H_bca_6 =     313.898; FM1_B11H_bca_err_6 =     4.06695 # 41 °C 5
FM1_B11H_bcs_6 =     17.3335; FM1_B11H_bcs_err_6 =    0.713878 # 41 °C 5
FM1_B11H_ac_7  =     27.0023; FM1_B11H_ac_err_7  =     4.51794 # 46 °C 5
FM1_B11H_ec_7  =  0.0791376; FM1_B11H_ec_err_7  = 0.000485621 # 46 °C 5
FM1_B11H_sc_7  =    0.413982; FM1_B11H_sc_err_7  =    0.370736 # 46 °C 5
FM1_B11H_bca_7 =     70.1842; FM1_B11H_bca_err_7 =     2.17544 # 46 °C 5
FM1_B11H_bcs_7 =     16.2358; FM1_B11H_bcs_err_7 =     1.36733 # 46 °C 5
FM1_B12H_ac_1  =     379.325; FM1_B12H_ac_err_1  =     26.8144 # −17 °C 6
FM1_B12H_ec_1  =  0.0749144; FM1_B12H_ec_err_1  = 0.00026902 # −17 °C 6
FM1_B12H_sc_1  =     1.57765; FM1_B12H_sc_err_1  =    0.223946 # −17 °C 6
FM1_B12H_bca_1 =     797.601; FM1_B12H_bca_err_1 =     10.5342 # −17 °C 6
FM1_B12H_bcs_1 =     17.2308; FM1_B12H_bcs_err_1 =    0.813261 # −17 °C 6
FM1_B12H_ac_2  =     330.642; FM1_B12H_ac_err_2  =     18.5532 # −9 °C 6
FM1_B12H_ec_2  =  0.0760474; FM1_B12H_ec_err_2  = 0.000182919 # −9 °C 6
FM1_B12H_sc_2  =    0.719777; FM1_B12H_sc_err_2  =    0.147651 # −9 °C 6
FM1_B12H_bca_2 =     839.259; FM1_B12H_bca_err_2 =      8.1996 # −9 °C 6
FM1_B12H_bcs_2 =      15.921; FM1_B12H_bcs_err_2 =    0.491495 # −9 °C 6
FM1_B12H_ac_3  =     403.071; FM1_B12H_ac_err_3  =     19.8241 # +6 °C 6
FM1_B12H_ec_3  =   0.077508; FM1_B12H_ec_err_3  = 0.000173452 # +6 °C 6
FM1_B12H_sc_3  =    0.778427; FM1_B12H_sc_err_3  =    0.138868 # +6 °C 6
FM1_B12H_bca_3 =     1004.16; FM1_B12H_bca_err_3 =      9.1496 # +6 °C 6
FM1_B12H_bcs_3 =      17.459; FM1_B12H_bcs_err_3 =    0.501228 # +6 °C 6
FM1_B12H_ac_4  =      416.58; FM1_B12H_ac_err_4  =     18.5861 # 19 °C 6
FM1_B12H_ec_4  =  0.0776683; FM1_B12H_ec_err_4  = 0.00014416 # 19 °C 6
FM1_B12H_sc_4  =     0.60056; FM1_B12H_sc_err_4  =    0.113909 # 19 °C 6
FM1_B12H_bca_4 =     1011.38; FM1_B12H_bca_err_4 =     8.41357 # 19 °C 6
FM1_B12H_bcs_4 =     17.3198; FM1_B12H_bcs_err_4 =    0.464426 # 19 °C 6
FM1_B12H_ac_5  =       402.5; FM1_B12H_ac_err_5  =     22.4272 # 30 °C 6
FM1_B12H_ec_5  =  0.0781036; FM1_B12H_ec_err_5  = 0.000230182 # 30 °C 6
FM1_B12H_sc_5  =     1.17202; FM1_B12H_sc_err_5  =    0.183845 # 30 °C 6
FM1_B12H_bca_5 =      1007.2; FM1_B12H_bca_err_5 =     11.3389 # 30 °C 6
FM1_B12H_bcs_5 =     16.5909; FM1_B12H_bcs_err_5 =    0.471125 # 30 °C 6
FM1_B12H_ac_6  =     500.388; FM1_B12H_ac_err_6  =     27.0865 # 41 °C 6
FM1_B12H_ec_6  =  0.0779308; FM1_B12H_ec_err_6  = 0.000236401 # 41 °C 6
FM1_B12H_sc_6  =     1.44531; FM1_B12H_sc_err_6  =    0.188493 # 41 °C 6
FM1_B12H_bca_6 =        1183; FM1_B12H_bca_err_6 =     13.5713 # 41 °C 6
FM1_B12H_bcs_6 =     16.4323; FM1_B12H_bcs_err_6 =     0.45793 # 41 °C 6
FM1_B12H_ac_7  =     115.752; FM1_B12H_ac_err_7  =     10.7513 # 46 °C 6
FM1_B12H_ec_7  =  0.0773812; FM1_B12H_ec_err_7  = 0.000334201 # 46 °C 6
FM1_B12H_sc_7  =    0.822695; FM1_B12H_sc_err_7  =    0.264606 # 46 °C 6
FM1_B12H_bca_7 =     284.148; FM1_B12H_bca_err_7 =     4.98819 # 46 °C 6
FM1_B12H_bcs_7 =     16.9855; FM1_B12H_bcs_err_7 =    0.901899 # 46 °C 6
FM1_A11H_ee0 =  0.0761756; FM1_A11H_ee0_err = 9.06417e−05
FM1_A11H_ee1 =   0.133623; FM1_A11H_ee1_err = 0.00690706
FM1_A11H_ee2 =   −19.7898; FM1_A11H_ee2_err =     2.39128
FM1_A12H_ee0 =  0.0769268; FM1_A12H_ee0_err = 4.08568e−05
FM1_A12H_ee1 =  0.0605053; FM1_A12H_ee1_err = 0.00380364
FM1_A12H_ee2 =   −3.60685; FM1_A12H_ee2_err =     1.17694
FM1_A21H_ee0 =  0.0770146; FM1_A21H_ee0_err = 0.000164735
FM1_A21H_ee1 =  0.0711896; FM1_A21H_ee1_err =  0.0124887
FM1_A21H_ee2 =   −3.28943; FM1_A21H_ee2_err =     4.32145
FM1_A22H_ee0 =  0.0749005; FM1_A22H_ee0_err = 0.000109036
FM1_A22H_ee1 =     0.1643; FM1_A22H_ee1_err = 0.00918743
FM1_A22H_ee2 =   −19.5779; FM1_A22H_ee2_err =     2.63255
FM1_B11H_ee0 =  0.0787493; FM1_B11H_ee0_err = 5.6614e−05
FM1_B11H_ee1 =   0.153165; FM1_B11H_ee1_err = 0.00502571
FM1_B11H_ee2 =   −31.8102; FM1_B11H_ee2_err =     1.41514
FM1_B12H_ee0 =  0.0765687; FM1_B12H_ee0_err = 3.62673e−05
FM1_B12H_ee1 =  0.0722531; FM1_B12H_ee1_err = 0.00267965
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FM1_B12H_ee2 =    -10.4155; FM1_B12H_ee2_err =    0.880126
FM1_HET_e0 =     1.00045; FM1_HET_e0_err = 2.26269e-05
FM1_HET_e1 =    0.088452; FM1_HET_e1_err = 0.000142354
FM1_HET_e2 =    -12.3574; FM1_HET_e2_err =  0.0446546
FM1_B13G_ax_1  =     135.148; FM1_B13G_ax_err_1  =     1.42288 # -17 °C
FM1_B13G_ex_1  =   0.0895239; FM1_B13G_ex_err_1  = 0.000103969 # -17 °C
FM1_B13G_sx_1  =    0.701027; FM1_B13G_sx_err_1  =   0.0119047 # -17 °C
FM1_B13G_ba_1  =      4967.9; FM1_B13G_ba_err_1  =     83.1078 # -17 °C
FM1_B13G_bs_1  =     99.1524; FM1_B13G_bs_err_1  =     42.5896 # -17 °C
FM1_B13G_ax_2  =     108.422; FM1_B13G_ax_err_2  =     1.34377 # -9 °C
FM1_B13G_ex_2  =   0.0900129; FM1_B13G_ex_err_2  = 0.00012757 # -9 °C
FM1_B13G_sx_2  =    0.775284; FM1_B13G_sx_err_2  =   0.0152779 # -9 °C
FM1_B13G_ba_2  =      4210.33; FM1_B13G_ba_err_2  =     89.4069 # -9 °C
FM1_B13G_bs_2  =     190.827; FM1_B13G_bs_err_2  =     196.429 # -9 °C
FM1_B13G_ax_3  =     157.512; FM1_B13G_ax_err_3  =     1.67168 # +6 °C
FM1_B13G_ex_3  =   0.0902104; FM1_B13G_ex_err_3  = 0.000112266 # +6 °C
FM1_B13G_sx_3  =    0.774575; FM1_B13G_sx_err_3  =    0.013207 # +6 °C
FM1_B13G_ba_3  =      6694.5; FM1_B13G_ba_err_3  =     112.179 # +6 °C
FM1_B13G_bs_3  =     53.9343; FM1_B13G_bs_err_3  =     12.4729 # +6 °C
FM1_B13G_ax_4  =     167.835; FM1_B13G_ax_err_4  =     1.75128 # 19 °C
FM1_B13G_ex_4  =   0.0902255; FM1_B13G_ex_err_4  = 0.000111537 # 19 °C
FM1_B13G_sx_4  =    0.779651; FM1_B13G_sx_err_4  =    0.013069 # 19 °C
FM1_B13G_ba_4  =     7302.07; FM1_B13G_ba_err_4  =     118.529 # 19 °C
FM1_B13G_bs_4  =      42.267; FM1_B13G_bs_err_4  =     7.41995 # 19 °C
FM1_B13G_ax_5  =     129.015; FM1_B13G_ax_err_5  =     1.67107 # 30 °C
FM1_B13G_ex_5  =   0.0903793; FM1_B13G_ex_err_5  = 0.000138563 # 30 °C
FM1_B13G_sx_5  =    0.819656; FM1_B13G_sx_err_5  =   0.0164877 # 30 °C
FM1_B13G_ba_5  =     6146.26; FM1_B13G_ba_err_5  =     118.659 # 30 °C
FM1_B13G_bs_5  =     46.2766; FM1_B13G_bs_err_5  =     10.4707 # 30 °C
FM1_B13G_ax_6  =     175.983; FM1_B13G_ax_err_6  =     2.03359 # 41 °C
FM1_B13G_ex_6  =    0.090532; FM1_B13G_ex_err_6  = 0.000124354 # 41 °C
FM1_B13G_sx_6  =    0.839103; FM1_B13G_sx_err_6  =    0.014814 # 41 °C
FM1_B13G_ba_6  =     8679.79; FM1_B13G_ba_err_6  =     146.747 # 41 °C
FM1_B13G_bs_6  =     42.5841; FM1_B13G_bs_err_6  =     7.73963 # 41 °C
FM1_B13G_ax_7  =     52.3512; FM1_B13G_ax_err_7  =     1.09226 # 46 °C
FM1_B13G_ex_7  =   0.0906045; FM1_B13G_ex_err_7  = 0.000228136 # 46 °C
FM1_B13G_sx_7  =    0.828535; FM1_B13G_sx_err_7  =   0.0267717 # 46 °C
FM1_B13G_ba_7  =     2597.24; FM1_B13G_ba_err_7  =     78.0345 # 46 °C
FM1_B13G_bs_7  =     34.9617; FM1_B13G_bs_err_7  =     9.33336 # 46 °C
FM1_B23G_ax_1  =      7.8606; FM1_B23G_ax_err_1  =    0.709821 # -17 °C
FM1_B23G_ex_1  =   0.0869659; FM1_B23G_ex_err_1  = 0.000843728 # -17 °C
FM1_B23G_sx_1  =    0.732368; FM1_B23G_sx_err_1  =    0.100516 # -17 °C
FM1_B23G_ba_1  =     1443.74; FM1_B23G_ba_err_1  =     47.5012 # -17 °C
FM1_B23G_bs_1  =     22.4764; FM1_B23G_bs_err_1  =     4.38138 # -17 °C
FM1_B23G_ax_2  =     7.50147; FM1_B23G_ax_err_2  =    0.642604 # -9 °C
FM1_B23G_ex_2  =   0.0893935; FM1_B23G_ex_err_2  = 0.000594038 # -9 °C
FM1_B23G_sx_2  =    0.459559; FM1_B23G_sx_err_2  =   0.0496395 # -9 °C
FM1_B23G_ba_2  =     1223.91; FM1_B23G_ba_err_2  =     19.2259 # -9 °C
FM1_B23G_bs_2  =     19.0827; FM1_B23G_bs_err_2  =     1.71954 # -9 °C
FM1_B23G_ax_3  =     10.7863; FM1_B23G_ax_err_3  =    0.758777 # +6 °C
FM1_B23G_ex_3  =   0.0870307; FM1_B23G_ex_err_3  = 0.00065518 # +6 °C
FM1_B23G_sx_3  =    0.718462; FM1_B23G_sx_err_3  =   0.0777719 # +6 °C
FM1_B23G_ba_3  =     1707.46; FM1_B23G_ba_err_3  =     50.3122 # +6 °C
FM1_B23G_bs_3  =     26.4423; FM1_B23G_bs_err_3  =     5.38984 # +6 °C
FM1_B23G_ax_4  =     10.9018; FM1_B23G_ax_err_4  =    0.803603 # 19 °C
FM1_B23G_ex_4  =   0.0872102; FM1_B23G_ex_err_4  = 0.000702168 # 19 °C
FM1_B23G_sx_4  =      0.7209; FM1_B23G_sx_err_4  =   0.0825498 # 19 °C
FM1_B23G_ba_4  =     1909.11; FM1_B23G_ba_err_4  =     53.1321 # 19 °C
FM1_B23G_bs_4  =     20.3261; FM1_B23G_bs_err_4  =     3.06854 # 19 °C
FM1_B23G_ax_5  =     7.35387; FM1_B23G_ax_err_5  =    0.64374 # 30 °C
FM1_B23G_ex_5  =   0.0893703; FM1_B23G_ex_err_5  = 0.000886312 # 30 °C
FM1_B23G_sx_5  =     0.66087; FM1_B23G_sx_err_5  =   0.0968401 # 30 °C
FM1_B23G_ba_5  =     1627.34; FM1_B23G_ba_err_5  =     36.9286 # 30 °C
FM1_B23G_bs_5  =     20.6617; FM1_B23G_bs_err_5  =     2.74742 # 30 °C
FM1_B23G_ax_6  =     35.7115; FM1_B23G_ax_err_6  =     1.71709 # 41 °C
FM1_B23G_ex_6  =   0.0873571; FM1_B23G_ex_err_6  = 0.000438052 # 41 °C
FM1_B23G_sx_6  =    0.847343; FM1_B23G_sx_err_6  =    0.054143 # 41 °C
FM1_B23G_ba_6  =     6136.67; FM1_B23G_ba_err_6  =      122.14 # 41 °C
FM1_B23G_bs_6  =      31.329; FM1_B23G_bs_err_6  =     4.92666 # 41 °C
FM1_B23G_ax_7  =     3.46817; FM1_B23G_ax_err_7  =    0.608366 # 46 °C
FM1_B23G_ex_7  =   0.0856728; FM1_B23G_ex_err_7  = 0.00154377 # 46 °C
FM1_B23G_sx_7  =    0.901463; FM1_B23G_sx_err_7  =    0.189004 # 46 °C
FM1_B23G_ba_7  =     639.218; FM1_B23G_ba_err_7  =     42.6913 # 46 °C
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FM1_B23G_bs_7  =     26.479; FM1_B23G_bs_err_7  =    11.5535 # 46 °C
FM1_B13G_ac_1  =    1393.87; FM1_B13G_ac_err_1  =    53.5059 # -17 °C
FM1_B13G_ec_1  =  0.0897031; FM1_B13G_ec_err_1  = 0.000163053 # -17 °C
FM1_B13G_sc_1  =    1.62297; FM1_B13G_sc_err_1  =   0.132111 # -17 °C
FM1_B13G_bca_1 =    3652.14; FM1_B13G_bca_err_1 =    24.1788 # -17 °C
FM1_B13G_bcs_1 =    20.0855; FM1_B13G_bcs_err_1 =   0.452888 # -17 °C
FM1_B13G_ac_2  =    1530.21; FM1_B13G_ac_err_2  =    55.9554 # -9 °C
FM1_B13G_ec_2  =  0.0901033; FM1_B13G_ec_err_2  = 0.000157902 # -9 °C
FM1_B13G_sc_2  =    1.59488; FM1_B13G_sc_err_2  =   0.127099 # -9 °C
FM1_B13G_bca_2 =     4217.6; FM1_B13G_bca_err_2 =    26.7928 # -9 °C
FM1_B13G_bcs_2 =    19.5125; FM1_B13G_bcs_err_2 =   0.382218 # -9 °C
FM1_B13G_ac_3  =    1877.42; FM1_B13G_ac_err_3  =    62.6161 # +6 °C
FM1_B13G_ec_3  =  0.0902001; FM1_B13G_ec_err_3  = 0.000144995 # +6 °C
FM1_B13G_sc_3  =    1.61655; FM1_B13G_sc_err_3  =   0.116558 # +6 °C
FM1_B13G_bca_3 =    5202.09; FM1_B13G_bca_err_3 =    30.0887 # +6 °C
FM1_B13G_bcs_3 =    19.6926; FM1_B13G_bcs_err_3 =   0.350791 # +6 °C
FM1_B13G_ac_4  =    1921.57; FM1_B13G_ac_err_4  =    63.1146 # 19 °C
FM1_B13G_ec_4  =  0.0904377; FM1_B13G_ec_err_4  = 0.000145065 # 19 °C
FM1_B13G_sc_4  =    1.64015; FM1_B13G_sc_err_4  =   0.116286 # 19 °C
FM1_B13G_bca_4 =    5275.08; FM1_B13G_bca_err_4 =    30.8252 # 19 °C
FM1_B13G_bcs_4 =    19.5225; FM1_B13G_bcs_err_4 =   0.336967 # 19 °C
FM1_B13G_ac_5  =    1974.62; FM1_B13G_ac_err_5  =    64.8101 # 30 °C
FM1_B13G_ec_5  =  0.0904667; FM1_B13G_ec_err_5  = 0.000145455 # 30 °C
FM1_B13G_sc_5  =    1.65331; FM1_B13G_sc_err_5  =   0.116318 # 30 °C
FM1_B13G_bca_5 =    5503.83; FM1_B13G_bca_err_5 =    31.8565 # 30 °C
FM1_B13G_bcs_5 =    19.6167; FM1_B13G_bcs_err_5 =   0.334083 # 30 °C
FM1_B13G_ac_6  =    2447.74; FM1_B13G_ac_err_6  =    75.5623 # 41 °C
FM1_B13G_ec_6  =  0.0905127; FM1_B13G_ec_err_6  = 0.000139122 # 41 °C
FM1_B13G_sc_6  =    1.79461; FM1_B13G_sc_err_6  =   0.111849 # 41 °C
FM1_B13G_bca_6 =    6660.16; FM1_B13G_bca_err_6 =    36.5432 # 41 °C
FM1_B13G_bcs_6 =    19.9948; FM1_B13G_bcs_err_6 =   0.326283 # 41 °C
FM1_B13G_ac_7  =     553.366; FM1_B13G_ac_err_7  =     35.743 # 46 °C
FM1_B13G_ec_7  =    0.090529; FM1_B13G_ec_err_7  = 0.000289075 # 46 °C
FM1_B13G_sc_7  =    1.72798; FM1_B13G_sc_err_7  =    0.23247 # 46 °C
FM1_B13G_bca_7 =    1577.21; FM1_B13G_bca_err_7 =    17.9793 # 46 °C
FM1_B13G_bcs_7 =    19.2033; FM1_B13G_bcs_err_7 =   0.606741 # 46 °C
FM1_B23G_ac_1  =     203.259; FM1_B23G_ac_err_1  =    15.0893 # -17 °C
FM1_B23G_ec_1  =  0.0896629; FM1_B23G_ec_err_1  = 0.000282063 # -17 °C
FM1_B23G_sc_1  =    0.962065; FM1_B23G_sc_err_1  =   0.223252 # -17 °C
FM1_B23G_bca_1 =      508.62; FM1_B23G_bca_err_1 =    7.46615 # -17 °C
FM1_B23G_bcs_1 =    15.1829; FM1_B23G_bcs_err_1 =   0.555187 # -17 °C
FM1_B23G_ac_2  =     228.651; FM1_B23G_ac_err_2  =    17.1048 # -9 °C
FM1_B23G_ec_2  =  0.0902106; FM1_B23G_ec_err_2  = 0.000315098 # -9 °C
FM1_B23G_sc_2  =     1.25291; FM1_B23G_sc_err_2  =   0.249371 # -9 °C
FM1_B23G_bca_2 =     547.333; FM1_B23G_bca_err_2 =    8.89672 # -9 °C
FM1_B23G_bcs_2 =    14.8526; FM1_B23G_bcs_err_2 =   0.523964 # -9 °C
FM1_B23G_ac_3  =     259.769; FM1_B23G_ac_err_3  =    19.2536 # +6 °C
FM1_B23G_ec_3  =    0.090704; FM1_B23G_ec_err_3  = 0.000326761 # +6 °C
FM1_B23G_sc_3  =    1.39861; FM1_B23G_sc_err_3  =   0.257772 # +6 °C
FM1_B23G_bca_3 =     636.846; FM1_B23G_bca_err_3 =    10.5397 # +6 °C
FM1_B23G_bcs_3 =    14.6379; FM1_B23G_bcs_err_3 =   0.472661 # +6 °C
FM1_B23G_ac_4  =     247.684; FM1_B23G_ac_err_4  =    16.3551 # 19 °C
FM1_B23G_ec_4  =  0.0904169; FM1_B23G_ec_err_4  = 0.000250837 # 19 °C
FM1_B23G_sc_4  =    0.892079; FM1_B23G_sc_err_4  =   0.200151 # 19 °C
FM1_B23G_bca_4 =     663.398; FM1_B23G_bca_err_4 =    8.7813 # 19 °C
FM1_B23G_bcs_4 =    14.2472; FM1_B23G_bcs_err_4 =   0.396547 # 19 °C
FM1_B23G_ac_5  =     262.205; FM1_B23G_ac_err_5  =    18.6126 # 30 °C
FM1_B23G_ec_5  =  0.0907803; FM1_B23G_ec_err_5  = 0.000298446 # 30 °C
FM1_B23G_sc_5  =    1.16936; FM1_B23G_sc_err_5  =   0.236475 # 30 °C
FM1_B23G_bca_5 =     712.872; FM1_B23G_bca_err_5 =    10.5319 # 30 °C
FM1_B23G_bcs_5 =    14.5399; FM1_B23G_bcs_err_5 =   0.415249 # 30 °C
FM1_B23G_ac_6  =     363.384; FM1_B23G_ac_err_6  =    24.3801 # 41 °C
FM1_B23G_ec_6  =  0.0909181; FM1_B23G_ec_err_6  = 0.000312528 # 41 °C
FM1_B23G_sc_6  =    1.65003; FM1_B23G_sc_err_6  =   0.246544 # 41 °C
FM1_B23G_bca_6 =     845.089; FM1_B23G_bca_err_6 =    13.3513 # 41 °C
FM1_B23G_bcs_6 =    14.7773; FM1_B23G_bcs_err_6 =    0.43432 # 41 °C
FM1_B23G_ac_7  =     87.0631; FM1_B23G_ac_err_7  =    10.7578 # 46 °C
FM1_B23G_ec_7  =  0.0906101; FM1_B23G_ec_err_7  = 0.000540909 # 46 °C
FM1_B23G_sc_7  =    1.37093; FM1_B23G_sc_err_7  =   0.428752 # 46 °C
FM1_B23G_bca_7 =     201.848; FM1_B23G_bca_err_7 =    5.59431 # 46 °C
FM1_B23G_bcs_7 =    15.3262; FM1_B23G_bcs_err_7 =   0.918759 # 46 °C
FM1_Bx3G_ee0   =   0.0899914; FM1_Bx3G_ee0_err   = 4.07034e-05
FM1_Bx3G_ee1   = 1.32462e-05; FM1_Bx3G_ee1_err   = 1.64208e-06
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1305  FM1_A11L_ratio_1  =    14.5117; FM1_A11L_ratio_err_1  = 6.15367e-05 # -17 °C 1
1306  FM1_A11L_ratio_2  =     13.698; FM1_A11L_ratio_err_2  = 6.5951e-06 # -9 °C 1
1307  FM1_A11L_ratio_3  =     14.237; FM1_A11L_ratio_err_3  = 1.01996e-05 # +6 °C 1
1308  FM1_A11L_ratio_4  =    13.9037; FM1_A11L_ratio_err_4  = 6.57077e-06 # 19 °C 1
1309  FM1_A11L_ratio_5  =     14.017; FM1_A11L_ratio_err_5  = 3.43042e-06 # 30 °C 1
1310  FM1_A11L_ratio_6  =    14.1076; FM1_A11L_ratio_err_6  = 5.46396e-06 # 41 °C 1
1311  FM1_A11L_ratio_7  =    14.1942; FM1_A11L_ratio_err_7  = 7.32858e-05 # 46 °C 1
1312  FM1_A12L_ratio_1  =    13.2401; FM1_A12L_ratio_err_1  = 4.66453e-06 # -17 °C 2
1313  FM1_A12L_ratio_2  =    13.7013; FM1_A12L_ratio_err_2  = 3.80089e-06 # -9 °C 2
1314  FM1_A12L_ratio_3  =    13.9122; FM1_A12L_ratio_err_3  = 2.97249e-06 # +6 °C 2
1315  FM1_A12L_ratio_4  =    14.2483; FM1_A12L_ratio_err_4  = 6.47245e-06 # 19 °C 2
1316  FM1_A12L_ratio_5  =    13.8495; FM1_A12L_ratio_err_5  = 3.1498e-06 # 30 °C 2
1317  FM1_A12L_ratio_6  =    14.0495; FM1_A12L_ratio_err_6  = 5.73464e-06 # 41 °C 2
1318  FM1_A12L_ratio_7  =    13.9062; FM1_A12L_ratio_err_7  = 4.79216e-06 # 46 °C 2
1319  FM1_A21L_ratio_1  =    13.7121; FM1_A21L_ratio_err_1  = 1.23556e-05 # -17 °C 3
1320  FM1_A21L_ratio_2  =    13.4928; FM1_A21L_ratio_err_2  = 9.61045e-06 # -9 °C 3
1321  FM1_A21L_ratio_3  =     13.966; FM1_A21L_ratio_err_3  = 1.17522e-05 # +6 °C 3
1322  FM1_A21L_ratio_4  =    13.6761; FM1_A21L_ratio_err_4  = 6.59792e-06 # 19 °C 3
1323  FM1_A21L_ratio_5  =    13.9192; FM1_A21L_ratio_err_5  = 1.10415e-05 # 30 °C 3
1324  FM1_A21L_ratio_6  =    13.9574; FM1_A21L_ratio_err_6  = 6.35667e-06 # 41 °C 3
1325  FM1_A21L_ratio_7  =    13.9842; FM1_A21L_ratio_err_7  = 1.29029e-05 # 46 °C 3
1326  FM1_A22L_ratio_1  =    13.4091; FM1_A22L_ratio_err_1  = 6.68979e-06 # -17 °C 4
1327  FM1_A22L_ratio_2  =    13.8166; FM1_A22L_ratio_err_2  = 3.83959e-06 # -9 °C 4
1328  FM1_A22L_ratio_3  =    14.1198; FM1_A22L_ratio_err_3  = 6.35086e-06 # +6 °C 4
1329  FM1_A22L_ratio_4  =    13.8704; FM1_A22L_ratio_err_4  = 3.90214e-06 # 19 °C 4
1330  FM1_A22L_ratio_5  =    13.8574; FM1_A22L_ratio_err_5  = 4.83357e-06 # 30 °C 4
1331  FM1_A22L_ratio_6  =    14.0431; FM1_A22L_ratio_err_6  = 5.09271e-06 # 41 °C 4
1332  FM1_A22L_ratio_7  =    13.9957; FM1_A22L_ratio_err_7  = 8.81682e-06 # 46 °C 4
1333  FM1_B11L_ratio_1  =    13.4744; FM1_B11L_ratio_err_1  = 8.72481e-06 # -17 °C 5
1334  FM1_B11L_ratio_2  =    14.0554; FM1_B11L_ratio_err_2  = 2.12073e-05 # -9 °C 5
1335  FM1_B11L_ratio_3  =    14.0733; FM1_B11L_ratio_err_3  = 9.39067e-06 # +6 °C 5
1336  FM1_B11L_ratio_4  =    14.0936; FM1_B11L_ratio_err_4  = 2.48264e-05 # 19 °C 5
1337  FM1_B11L_ratio_5  =     13.865; FM1_B11L_ratio_err_5  = 7.74723e-06 # 30 °C 5
1338  FM1_B11L_ratio_6  =    14.4173; FM1_B11L_ratio_err_6  = 1.65379e-05 # 41 °C 5
1339  FM1_B11L_ratio_7  =    14.1502; FM1_B11L_ratio_err_7  = 4.45397e-05 # 46 °C 5
1340  FM1_B12L_ratio_1  =    13.8602; FM1_B12L_ratio_err_1  = 8.69413e-06 # -17 °C 6
1341  FM1_B12L_ratio_2  =    13.5886; FM1_B12L_ratio_err_2  = 5.34409e-06 # -9 °C 6
1342  FM1_B12L_ratio_3  =    13.8353; FM1_B12L_ratio_err_3  = 4.10086e-06 # +6 °C 6
1343  FM1_B12L_ratio_4  =     14.108; FM1_B12L_ratio_err_4  = 5.42736e-06 # 19 °C 6
1344  FM1_B12L_ratio_5  =    14.0487; FM1_B12L_ratio_err_5  = 5.01758e-06 # 30 °C 6
1345  FM1_B12L_ratio_6  =    13.9139; FM1_B12L_ratio_err_6  = 5.05546e-06 # 41 °C 6
1346  FM1_B12L_ratio_7  =    13.6321; FM1_B12L_ratio_err_7  = 7.09162e-06 # 46 °C 6
1347  FM1_B21L_ratio_1  =    13.8204; FM1_B21L_ratio_err_1  = 1.05781e-05 # -17 °C 7
1348  FM1_B21L_ratio_2  =    14.1611; FM1_B21L_ratio_err_2  = 1.20792e-05 # -9 °C 7
1349  FM1_B21L_ratio_3  =    14.1862; FM1_B21L_ratio_err_3  = 1.24979e-05 # +6 °C 7
1350  FM1_B21L_ratio_4  =    14.3347; FM1_B21L_ratio_err_4  = 9.41172e-06 # 19 °C 7
1351  FM1_B21L_ratio_5  =    14.0383; FM1_B21L_ratio_err_5  = 1.66375e-05 # 30 °C 7
1352  FM1_B21L_ratio_6  =     13.899; FM1_B21L_ratio_err_6  = 2.8855e-05 # 41 °C 7
1353  FM1_B21L_ratio_7  =    13.6006; FM1_B21L_ratio_err_7  = 5.4772e-05 # 46 °C 7
1354  FM1_B22L_ratio_1  =    13.3159; FM1_B22L_ratio_err_1  = 6.00753e-06 # -17 °C 8
1355  FM1_B22L_ratio_2  =    13.7433; FM1_B22L_ratio_err_2  = 5.93613e-06 # -9 °C 8
1356  FM1_B22L_ratio_3  =    14.0689; FM1_B22L_ratio_err_3  = 4.19553e-06 # +6 °C 8
1357  FM1_B22L_ratio_4  =    13.6646; FM1_B22L_ratio_err_4  = 4.62893e-06 # 19 °C 8
1358  FM1_B22L_ratio_5  =    13.9448; FM1_B22L_ratio_err_5  = 3.9838e-06 # 30 °C 8
1359  FM1_B22L_ratio_6  =    13.7407; FM1_B22L_ratio_err_6  = 3.37761e-06 # 41 °C 8
1360  FM1_B22L_ratio_7  =    14.1457; FM1_B22L_ratio_err_7  = 1.06954e-05 # 46 °C 8
1361  FM1_A11L_ee0 =     13.8432; FM1_A11L_ee0_err = 4.50557e-06
1362  FM1_A11L_ee1 =   0.0590508; FM1_A11L_ee1_err = 2.55288e-06
1363  FM1_A11L_ee2 =    -4.39775; FM1_A11L_ee2_err = 0.00074524
1364  FM1_A12L_ee0 =     13.7966; FM1_A12L_ee0_err = 2.07367e-06
1365  FM1_A12L_ee1 =    0.132836; FM1_A12L_ee1_err = 1.04965e-06
1366  FM1_A12L_ee2 =    -27.4371; FM1_A12L_ee2_err = 0.000310979
1367  FM1_A21L_ee0 =     13.6555; FM1_A21L_ee0_err = 5.21731e-06
1368  FM1_A21L_ee1 =   0.0259873; FM1_A21L_ee1_err = 2.52971e-06
1369  FM1_A21L_ee2 =     6.53763; FM1_A21L_ee2_err = 0.000704908
1370  FM1_A22L_ee0 =     13.8317; FM1_A22L_ee0_err = 2.68134e-06
1371  FM1_A22L_ee1 =   0.0646319; FM1_A22L_ee1_err = 1.30337e-06
1372  FM1_A22L_ee2 =     -10.368; FM1_A22L_ee2_err = 0.00041608
1373  FM1_B11L_ee0 =     13.8663; FM1_B11L_ee0_err = 7.18768e-06
1374  FM1_B11L_ee1 =    0.100857; FM1_B11L_ee1_err = 2.50188e-06
1375  FM1_B11L_ee2 =    -19.2871; FM1_B11L_ee2_err = 0.00104257
1376  FM1_B12L_ee0 =     13.8522; FM1_B12L_ee0_err = 2.82086e-06
1377  FM1_B12L_ee1 =   0.0962026; FM1_B12L_ee1_err = 1.61409e-06
1378  FM1_B12L_ee2 =    -22.4469; FM1_B12L_ee2_err = 0.000437193
1379  FM1_B21L_ee0 =     14.2365; FM1_B21L_ee0_err = 7.22578e-06
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1380  FM1_B21L_ee1 =   0.0920922; FM1_B21L_ee1_err = 2.64434e-06
1381  FM1_B21L_ee2 =    -39.5918; FM1_B21L_ee2_err = 0.00124964
1382  FM1_B22L_ee0 =     13.8041; FM1_B22L_ee0_err = 2.71099e-06
1383  FM1_B22L_ee1 =   0.0995824; FM1_B22L_ee1_err = 1.32624e-06
1384  FM1_B22L_ee2 =    -25.3884; FM1_B22L_ee2_err = 0.000381995
1385  FM1_HL_e0 =    0.999854; FM1_HL_e0_err = 1.13304e-06
1386  FM1_HL_e1 =     0.09727; FM1_HL_e1_err = 7.77725e-06
1387  FM1_HL_e2 =    -19.8792; FM1_HL_e2_err = 0.00232768
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3.5 FM2 results

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# Mi 19. Okt 11:48:31 CEST 2016
FM2_C1_ax_1  =    29.5425; FM2_C1_ax_err_1  =   0.729261 # -7 °C 1
FM2_C1_ex_1  =   0.102406; FM2_C1_ex_err_1  = 9.61862e-05 # -7 °C 1
FM2_C1_sx_1  =   0.270194; FM2_C1_sx_err_1  = 0.00641448 # -7 °C 1
FM2_C1_ba_1  =    423.234; FM2_C1_ba_err_1  =    5.37499 # -7 °C 1
FM2_C1_bs_1  =    7.85446; FM2_C1_bs_err_1  =   0.277467 # -7 °C 1
FM2_C1_ax_2  =    20.3129; FM2_C1_ax_err_2  =   0.574188 # +7 °C 1
FM2_C1_ex_2  =   0.102844; FM2_C1_ex_err_2  = 0.00017044 # +7 °C 1
FM2_C1_sx_2  =   0.412432; FM2_C1_sx_err_2  =  0.0117738 # +7 °C 1
FM2_C1_ba_2  =    442.851; FM2_C1_ba_err_2  =    5.62521 # +7 °C 1
FM2_C1_bs_2  =    7.63963; FM2_C1_bs_err_2  =   0.257137 # +7 °C 1
FM2_C1_ax_3  =    23.2779; FM2_C1_ax_err_3  =   0.588288 # +19 °C 1
FM2_C1_ex_3  =   0.107044; FM2_C1_ex_err_3  = 0.00015543 # +19 °C 1
FM2_C1_sx_3  =   0.390309; FM2_C1_sx_err_3  = 0.00973236 # +19 °C 1
FM2_C1_ba_3  =    461.665; FM2_C1_ba_err_3  =    5.88725 # +19 °C 1
FM2_C1_bs_3  =    6.83259; FM2_C1_bs_err_3  =   0.200424 # +19 °C 1
FM2_C1_ax_4  =     34.394; FM2_C1_ax_err_4  =   0.735125 # +33 °C 1
FM2_C1_ex_4  =   0.104536; FM2_C1_ex_err_4  = 0.000101926 # +33 °C 1
FM2_C1_sx_4  =   0.320475; FM2_C1_sx_err_4  = 0.00649685 # +33 °C 1
FM2_C1_ba_4  =    520.775; FM2_C1_ba_err_4  =    6.02688 # +33 °C 1
FM2_C1_bs_4  =    7.83874; FM2_C1_bs_err_4  =   0.246907 # +33 °C 1
FM2_C1_ax_5  =     12.117; FM2_C1_ax_err_5  =   0.419751 # +42 °C 1
FM2_C1_ex_5  =   0.106966; FM2_C1_ex_err_5  = 0.000249723 # +42 °C 1
FM2_C1_sx_5  =   0.466516; FM2_C1_sx_err_5  =  0.0168438 # +42 °C 1
FM2_C1_ba_5  =    279.581; FM2_C1_ba_err_5  =    4.72517 # +42 °C 1
FM2_C1_bs_5  =    6.87321; FM2_C1_bs_err_5  =   0.265558 # +42 °C 1
FM2_C1_ax_6  =    20.3655; FM2_C1_ax_err_6  =   0.540154 # +44 °C 1
FM2_C1_ex_6  =   0.105898; FM2_C1_ex_err_6  = 0.000208851 # +44 °C 1
FM2_C1_sx_6  =   0.523842; FM2_C1_sx_err_6  =  0.0151939 # +44 °C 1
FM2_C1_ba_6  =    521.913; FM2_C1_ba_err_6  =    6.57301 # +44 °C 1
FM2_C1_bs_6  =    6.86442; FM2_C1_bs_err_6  =   0.197336 # +44 °C 1
FM2_C2_ax_1  =     27.256; FM2_C2_ax_err_1  =   0.677775 # -7 °C 2
FM2_C2_ex_1  =   0.100375; FM2_C2_ex_err_1  = 0.000112931 # -7 °C 2
FM2_C2_sx_1  =   0.310851; FM2_C2_sx_err_1  = 0.00726757 # -7 °C 2
FM2_C2_ba_1  =    433.156; FM2_C2_ba_err_1  =    5.52314 # -7 °C 2
FM2_C2_bs_1  =    7.58213; FM2_C2_bs_err_1  =   0.258699 # -7 °C 2
FM2_C2_ax_2  =    20.0821; FM2_C2_ax_err_2  =   0.560193 # +7 °C 2
FM2_C2_ex_2  =   0.101535; FM2_C2_ex_err_2  = 0.000186918 # +7 °C 2
FM2_C2_sx_2  =   0.457383; FM2_C2_sx_err_2  =  0.0133699 # +7 °C 2
FM2_C2_ba_2  =     459.52; FM2_C2_ba_err_2  =    5.82703 # +7 °C 2
FM2_C2_bs_2  =    7.27154; FM2_C2_bs_err_2  =   0.232351 # +7 °C 2
FM2_C2_ax_3  =    19.2457; FM2_C2_ax_err_3  =   0.525827 # +19 °C 2
FM2_C2_ex_3  =   0.103244; FM2_C2_ex_err_3  = 0.000213609 # +19 °C 2
FM2_C2_sx_3  =   0.523379; FM2_C2_sx_err_3  =  0.0157158 # +19 °C 2
FM2_C2_ba_3  =    484.663; FM2_C2_ba_err_3  =    6.22052 # +19 °C 2
FM2_C2_bs_3  =    6.87252; FM2_C2_bs_err_3  =    0.20537 # +19 °C 2
FM2_C2_ax_4  =    31.5091; FM2_C2_ax_err_4  =   0.694635 # +33 °C 2
FM2_C2_ex_4  =   0.104736; FM2_C2_ex_err_4  = 0.000121012 # +33 °C 2
FM2_C2_sx_4  =   0.362955; FM2_C2_sx_err_4  = 0.00772387 # +33 °C 2
FM2_C2_ba_4  =    544.804; FM2_C2_ba_err_4  =    6.27003 # +33 °C 2
FM2_C2_bs_4  =    6.95912; FM2_C2_bs_err_4  =     0.1919 # +33 °C 2
FM2_C2_ax_5  =     12.526; FM2_C2_ax_err_5  =   0.433964 # +42 °C 2
FM2_C2_ex_5  =   0.101651; FM2_C2_ex_err_5  = 0.00024814 # +42 °C 2
FM2_C2_sx_5  =   0.494073; FM2_C2_sx_err_5  =  0.0184307 # +42 °C 2
FM2_C2_ba_5  =    294.221; FM2_C2_ba_err_5  =     4.7334 # +42 °C 2
FM2_C2_bs_5  =    6.69947; FM2_C2_bs_err_5  =   0.246932 # +42 °C 2
FM2_C2_ax_6  =    25.0493; FM2_C2_ax_err_6  =    0.62342 # +44 °C 2
FM2_C2_ex_6  =   0.101959; FM2_C2_ex_err_6  = 0.000159044 # +44 °C 2
FM2_C2_sx_6  =   0.439944; FM2_C2_sx_err_6  =  0.0113228 # +44 °C 2
FM2_C2_ba_6  =    525.371; FM2_C2_ba_err_6  =    6.17415 # +44 °C 2
FM2_C2_bs_6  =    7.43745; FM2_C2_bs_err_6  =   0.224454 # +44 °C 2
FM2_C3_ax_1  =    34.7505; FM2_C3_ax_err_1  =    0.76529 # -7 °C 3
FM2_C3_ex_1  =   0.105402; FM2_C3_ex_err_1  = 0.000108083 # -7 °C 3
FM2_C3_sx_1  =   0.320349; FM2_C3_sx_err_1  = 0.00676744 # -7 °C 3
FM2_C3_ba_1  =    670.714; FM2_C3_ba_err_1  =    6.81058 # -7 °C 3
FM2_C3_bs_1  =    7.73936; FM2_C3_bs_err_1  =   0.210272 # -7 °C 3
FM2_C3_ax_2  =    35.7654; FM2_C3_ax_err_2  =    0.78675 # +7 °C 3
FM2_C3_ex_2  =   0.104996; FM2_C3_ex_err_2  = 0.000101688 # +7 °C 3
FM2_C3_sx_2  =   0.307477; FM2_C3_sx_err_2  = 0.00648042 # +7 °C 3
FM2_C3_ba_2  =    671.837; FM2_C3_ba_err_2  =     6.7672 # +7 °C 3
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FM2_C3_bs_2  =     7.98823;  FM2_C3_bs_err_2  =    0.224408 # +7 °C 3
FM2_C3_ax_3  =     42.2957;  FM2_C3_ax_err_3  =    0.867298 # +19 °C 3
FM2_C3_ex_3  =    0.102812;  FM2_C3_ex_err_3  = 8.75589e-05 # +19 °C 3
FM2_C3_sx_3  =    0.289703;  FM2_C3_sx_err_3  = 0.00568047 # +19 °C 3
FM2_C3_ba_3  =     714.059;  FM2_C3_ba_err_3  =     6.95755 # +19 °C 3
FM2_C3_bs_3  =     8.95209;  FM2_C3_bs_err_3  =    0.272982 # +19 °C 3
FM2_C3_ax_4  =     32.1759;  FM2_C3_ax_err_4  =    0.714862 # +33 °C 3
FM2_C3_ex_4  =    0.103457;  FM2_C3_ex_err_4  = 0.00015915 # +33 °C 3
FM2_C3_sx_4  =    0.488852;  FM2_C3_sx_err_4  =   0.0116996 # +33 °C 3
FM2_C3_ba_4  =     881.765;  FM2_C3_ba_err_4  =     8.09594 # +33 °C 3
FM2_C3_bs_4  =     8.02604;  FM2_C3_bs_err_4  =    0.201724 # +33 °C 3
FM2_C3_ax_5  =     21.2881;  FM2_C3_ax_err_5  =    0.584236 # +42 °C 3
FM2_C3_ex_5  =    0.105506;  FM2_C3_ex_err_5  = 0.000154935 # +42 °C 3
FM2_C3_sx_5  =    0.368589;  FM2_C3_sx_err_5  = 0.00988347 # +42 °C 3
FM2_C3_ba_5  =     448.189;  FM2_C3_ba_err_5  =     5.59578 # +42 °C 3
FM2_C3_bs_5  =     8.52078;  FM2_C3_bs_err_5  =     0.31046 # +42 °C 3
FM2_C3_ax_6  =     33.5235;  FM2_C3_ax_err_6  =    0.723266 # +44 °C 3
FM2_C3_ex_6  =     0.10671;  FM2_C3_ex_err_6  = 0.00013931 # +44 °C 3
FM2_C3_sx_6  =    0.418893;  FM2_C3_sx_err_6  = 0.00916853 # +44 °C 3
FM2_C3_ba_6  =     803.689;  FM2_C3_ba_err_6  =     7.68882 # +44 °C 3
FM2_C3_bs_6  =     7.65555;  FM2_C3_bs_err_6  =    0.188506 # +44 °C 3
FM2_C4_ax_1  =     24.0092;  FM2_C4_ax_err_1  =     0.58932 # -7 °C 4
FM2_C4_ex_1  =    0.104144;  FM2_C4_ex_err_1  = 0.000189506 # -7 °C 4
FM2_C4_sx_1  =    0.518203;  FM2_C4_sx_err_1  =   0.0139076 # -7 °C 4
FM2_C4_ba_1  =     607.614;  FM2_C4_ba_err_1  =     6.94212 # -7 °C 4
FM2_C4_bs_1  =     7.08607;  FM2_C4_bs_err_1  =    0.193428 # -7 °C 4
FM2_C4_ax_2  =     44.9218;  FM2_C4_ax_err_2  =    0.870239 # +7 °C 4
FM2_C4_ex_2  =    0.104213;  FM2_C4_ex_err_2  = 7.63089e-05 # +7 °C 4
FM2_C4_sx_2  =    0.267326;  FM2_C4_sx_err_2  = 0.00488975 # +7 °C 4
FM2_C4_ba_2  =     572.054;  FM2_C4_ba_err_2  =     6.28585 # +7 °C 4
FM2_C4_bs_2  =     8.46119;  FM2_C4_bs_err_2  =    0.274984 # +7 °C 4
FM2_C4_ax_3  =     26.3504;  FM2_C4_ax_err_3  =    0.606122 # +19 °C 4
FM2_C4_ex_3  =    0.104163;  FM2_C4_ex_err_3  = 0.000182035 # +19 °C 4
FM2_C4_sx_3  =    0.539401;  FM2_C4_sx_err_3  =   0.0137097 # +19 °C 4
FM2_C4_ba_3  =     647.912;  FM2_C4_ba_err_3  =     7.23252 # +19 °C 4
FM2_C4_bs_3  =      7.2104;  FM2_C4_bs_err_3  =     0.19487 # +19 °C 4
FM2_C4_ax_4  =     48.6012;  FM2_C4_ax_err_4  =    0.874937 # +33 °C 4
FM2_C4_ex_4  =    0.105111;  FM2_C4_ex_err_4  = 8.64586e-05 # +33 °C 4
FM2_C4_sx_4  =    0.322394;  FM2_C4_sx_err_4  = 0.00545826 # +33 °C 4
FM2_C4_ba_4  =     744.746;  FM2_C4_ba_err_4  =     7.22542 # +33 °C 4
FM2_C4_bs_4  =     8.32613;  FM2_C4_bs_err_4  =    0.233649 # +33 °C 4
FM2_C4_ax_5  =     18.1948;  FM2_C4_ax_err_5  =    0.519806 # +42 °C 4
FM2_C4_ex_5  =    0.106046;  FM2_C4_ex_err_5  = 0.000196985 # +42 °C 4
FM2_C4_sx_5  =     0.45452;  FM2_C4_sx_err_5  =   0.0133963 # +42 °C 4
FM2_C4_ba_5  =     403.208;  FM2_C4_ba_err_5  =     5.56568 # +42 °C 4
FM2_C4_bs_5  =     7.37521;  FM2_C4_bs_err_5  =    0.254284 # +42 °C 4
FM2_C4_ax_6  =     27.7822;  FM2_C4_ax_err_6  =    0.621728 # +44 °C 4
FM2_C4_ex_6  =    0.104536;  FM2_C4_ex_err_6  = 0.000184007 # +44 °C 4
FM2_C4_sx_6  =    0.556829;  FM2_C4_sx_err_6  =   0.0139772 # +44 °C 4
FM2_C4_ba_6  =     737.087;  FM2_C4_ba_err_6  =     7.79023 # +44 °C 4
FM2_C4_bs_6  =     7.30396;  FM2_C4_bs_err_6  =    0.188012 # +44 °C 4
FM2_A1_ax_1  =     66.4347;  FM2_A1_ax_err_1  =     1.36471 # -7 °C 5
FM2_A1_ex_1  =   0.0987328;  FM2_A1_ex_err_1  = 7.88918e-05 # -7 °C 5
FM2_A1_sx_1  =    0.284103;  FM2_A1_sx_err_1  = 0.00674812 # -7 °C 5
FM2_A1_ba_1  =     1625.79;  FM2_A1_ba_err_1  =     42.1216 # -7 °C 5
FM2_A1_bs_1  =     5.60959;  FM2_A1_bs_err_1  =    0.283579 # -7 °C 5
FM2_A1_ax_2  =     51.6312;  FM2_A1_ax_err_2  =    0.978767 # +7 °C 5
FM2_A1_ex_2  =   0.0974559;  FM2_A1_ex_err_2  = 0.000120914 # +7 °C 5
FM2_A1_sx_2  =    0.421747;  FM2_A1_sx_err_2  = 0.00824072 # +7 °C 5
FM2_A1_ba_2  =     1540.04;  FM2_A1_ba_err_2  =     11.5259 # +7 °C 5
FM2_A1_bs_2  =     7.17393;  FM2_A1_bs_err_2  =    0.138039 # +7 °C 5
FM2_A1_ax_3  =     46.6445;  FM2_A1_ax_err_3  =    0.863742 # +19 °C 5
FM2_A1_ex_3  =    0.098419;  FM2_A1_ex_err_3  = 0.000151183 # +19 °C 5
FM2_A1_sx_3  =    0.538737;  FM2_A1_sx_err_3  =   0.0113163 # +19 °C 5
FM2_A1_ba_3  =     1623.89;  FM2_A1_ba_err_3  =      12.229 # +19 °C 5
FM2_A1_bs_3  =     7.13334;  FM2_A1_bs_err_3  =    0.133846 # +19 °C 5
FM2_A1_ax_4  =     61.9074;  FM2_A1_ax_err_4  =     1.03606 # +33 °C 5
FM2_A1_ex_4  =    0.100067;  FM2_A1_ex_err_4  = 0.000117763 # +33 °C 5
FM2_A1_sx_4  =    0.466959;  FM2_A1_sx_err_4  = 0.00832831 # +33 °C 5
FM2_A1_ba_4  =     1861.72;  FM2_A1_ba_err_4  =     12.4331 # +33 °C 5
FM2_A1_bs_4  =     7.24086;  FM2_A1_bs_err_4  =    0.124495 # +33 °C 5
FM2_A1_ax_5  =      31.276;  FM2_A1_ax_err_5  =     1.44298 # +42 °C 5
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FM2_A1_ex_5  =  0.0966723; FM2_A1_ex_err_5  = 0.000314969 # +42 °C 5
FM2_A1_sx_5  =  0.572445; FM2_A1_sx_err_5  =  0.0313127 # +42 °C 5
FM2_A1_ba_5  =  823.003; FM2_A1_ba_err_5  =  91.9475 # +42 °C 5
FM2_A1_bs_5  =  19.1136; FM2_A1_bs_err_5  =  16.1735 # +42 °C 5
FM2_A1_ax_6  =  57.4776; FM2_A1_ax_err_6  =  1.02798 # +44 °C 5
FM2_A1_ex_6  =  0.0985128; FM2_A1_ex_err_6  = 0.00012101 # +44 °C 5
FM2_A1_sx_6  =  0.449065; FM2_A1_sx_err_6  = 0.00850181 # +44 °C 5
FM2_A1_ba_6  =  1838.2; FM2_A1_ba_err_6  =  12.4604 # +44 °C 5
FM2_A1_bs_6  =  7.17959; FM2_A1_bs_err_6  =  0.124547 # +44 °C 5
FM2_A2_ax_1  =  67.9665; FM2_A2_ax_err_1  =  1.27662 # −7 °C 6
FM2_A2_ex_1  =  0.102312; FM2_A2_ex_err_1  = 7.94893e−05 # −7 °C 6
FM2_A2_sx_1  =  0.314016; FM2_A2_sx_err_1  = 0.00633492 # −7 °C 6
FM2_A2_ba_1  =  1483.6; FM2_A2_ba_err_1  =  32.6654 # −7 °C 6
FM2_A2_bs_1  =  5.99937; FM2_A2_bs_err_1  =  0.286639 # −7 °C 6
FM2_A2_ax_2  =  66.9547; FM2_A2_ax_err_2  =  1.06659 # +7 °C 6
FM2_A2_ex_2  =  0.102693; FM2_A2_ex_err_2  = 8.57901e−05 # +7 °C 6
FM2_A2_sx_2  =  0.366993; FM2_A2_sx_err_2  =  0.0055935 # +7 °C 6
FM2_A2_ba_2  =  1367.51; FM2_A2_ba_err_2  =  10.275 # +7 °C 6
FM2_A2_bs_2  =  8.32826; FM2_A2_bs_err_2  =  0.187567 # +7 °C 6
FM2_A2_ax_3  =  55.1; FM2_A2_ax_err_3  =  0.928012 # +19 °C 6
FM2_A2_ex_3  =  0.103195; FM2_A2_ex_err_3  = 0.000122831 # +19 °C 6
FM2_A2_sx_3  =  0.499602; FM2_A2_sx_err_3  = 0.00907791 # +19 °C 6
FM2_A2_ba_3  =  1459.06; FM2_A2_ba_err_3  =  10.9398 # +19 °C 6
FM2_A2_bs_3  =  7.73392; FM2_A2_bs_err_3  =  0.15852 # +19 °C 6
FM2_A2_ax_4  =  57.2947; FM2_A2_ax_err_4  =  0.872743 # +33 °C 6
FM2_A2_ex_4  =  0.104456; FM2_A2_ex_err_4  = 0.000135728 # +33 °C 6
FM2_A2_sx_4  =  0.60288; FM2_A2_sx_err_4  =  0.0106136 # +33 °C 6
FM2_A2_ba_4  =  1673.66; FM2_A2_ba_err_4  =  12.3642 # +33 °C 6
FM2_A2_bs_4  =  7.46453; FM2_A2_bs_err_4  =  0.139976 # +33 °C 6
FM2_A2_ax_5  =  32.584; FM2_A2_ax_err_5  =  0.85165 # +42 °C 6
FM2_A2_ex_5  =  0.105613; FM2_A2_ex_err_5  = 0.000199249 # +42 °C 6
FM2_A2_sx_5  =  0.453039; FM2_A2_sx_err_5  =  0.0143358 # +42 °C 6
FM2_A2_ba_5  =  1000.04; FM2_A2_ba_err_5  =  29.5237 # +42 °C 6
FM2_A2_bs_5  =  4.96545; FM2_A2_bs_err_5  =  0.388988 # +42 °C 6
FM2_A2_ax_6  =  59.1; FM2_A2_ax_err_6  =  0.938638 # +44 °C 6
FM2_A2_ex_6  =  0.105643; FM2_A2_ex_err_6  = 0.000124157 # +44 °C 6
FM2_A2_sx_6  =  0.529029; FM2_A2_sx_err_6  =  0.0092152 # +44 °C 6
FM2_A2_ba_6  =  1638.15; FM2_A2_ba_err_6  =  11.7444 # +44 °C 6
FM2_A2_bs_6  =  7.42538; FM2_A2_bs_err_6  =  0.136883 # +44 °C 6
FM2_A3_ax_1  =  61.0514; FM2_A3_ax_err_1  =  1.39013 # −7 °C 7
FM2_A3_ex_1  =  0.10165; FM2_A3_ex_err_1  = 0.000170946 # −7 °C 7
FM2_A3_sx_1  =  0.572663; FM2_A3_sx_err_1  =  0.0177759 # −7 °C 7
FM2_A3_ba_1  =  2114.06; FM2_A3_ba_err_1  =  81.1388 # −7 °C 7
FM2_A3_bs_1  =  8.779; FM2_A3_bs_err_1  =  0.937678 # −7 °C 7
FM2_A3_ax_2  =  103.204; FM2_A3_ax_err_2  =  1.40086 # +7 °C 7
FM2_A3_ex_2  =  0.103088; FM2_A3_ex_err_2  = 6.10604e−05 # +7 °C 7
FM2_A3_sx_2  =  0.306801; FM2_A3_sx_err_2  = 0.00396069 # +7 °C 7
FM2_A3_ba_2  =  2160.07; FM2_A3_ba_err_2  =  12.6517 # +7 °C 7
FM2_A3_bs_2  =  8.66542; FM2_A3_bs_err_2  =  0.159577 # +7 °C 7
FM2_A3_ax_3  =  72.2104; FM2_A3_ax_err_3  =  1.12971 # +19 °C 7
FM2_A3_ex_3  =  0.101105; FM2_A3_ex_err_3  = 0.000112829 # +19 °C 7
FM2_A3_sx_3  =  0.488515; FM2_A3_sx_err_3  = 0.00830928 # +19 °C 7
FM2_A3_ba_3  =  2420.24; FM2_A3_ba_err_3  =  14.1156 # +19 °C 7
FM2_A3_bs_3  =  8.18944; FM2_A3_bs_err_3  =  0.1381 # +19 °C 7
FM2_A3_ax_4  =  131.128; FM2_A3_ax_err_4  =  1.429 # +33 °C 7
FM2_A3_ex_4  =  0.103762; FM2_A3_ex_err_4  = 5.93293e−05 # +33 °C 7
FM2_A3_sx_4  =  0.369167; FM2_A3_sx_err_4  = 0.00389338 # +33 °C 7
FM2_A3_ba_4  =  2355.32; FM2_A3_ba_err_4  =  15.6579 # +33 °C 7
FM2_A3_bs_4  = −1.96965e+07; FM2_A3_bs_err_4  = 8.74534e+11 # +33 °C 7
FM2_A3_ax_5  =  38.2256; FM2_A3_ax_err_5  =  1.17308 # +42 °C 7
FM2_A3_ex_5  =  0.102972; FM2_A3_ex_err_5  = 0.000256942 # +42 °C 7
FM2_A3_sx_5  =  0.61966; FM2_A3_sx_err_5  =  0.0270685 # +42 °C 7
FM2_A3_ba_5  =  1442.99; FM2_A3_ba_err_5  =  75.1868 # +42 °C 7
FM2_A3_bs_5  =  8.93413; FM2_A3_bs_err_5  =  1.31858 # +42 °C 7
FM2_A3_ax_6  =  68.6832; FM2_A3_ax_err_6  =  1.03193 # +44 °C 7
FM2_A3_ex_6  =  0.102617; FM2_A3_ex_err_6  = 0.00013325 # +44 °C 7
FM2_A3_sx_6  =  0.594515; FM2_A3_sx_err_6  =  0.0104763 # +44 °C 7
FM2_A3_ba_6  =  2718.18; FM2_A3_ba_err_6  =  15.5641 # +44 °C 7
FM2_A3_bs_6  =  7.91262; FM2_A3_bs_err_6  =  0.122434 # +44 °C 7
FM2_A4_ax_1  =  98.102; FM2_A4_ax_err_1  =  1.6214 # −7 °C 8
FM2_A4_ex_1  =  0.102605; FM2_A4_ex_err_1  = 5.98207e−05 # −7 °C 8
FM2_A4_sx_1  =  0.272731; FM2_A4_sx_err_1  = 0.00482057 # −7 °C 8
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FM2_A4_ba_1  =    2202.88; FM2_A4_ba_err_1  =    34.1356 # -7 °C 8
FM2_A4_bs_1  =    6.06992; FM2_A4_bs_err_1  =   0.211642 # -7 °C 8
FM2_A4_ax_2  =    104.741; FM2_A4_ax_err_2  =    1.38987 # +7 °C 8
FM2_A4_ex_2  =   0.103192; FM2_A4_ex_err_2  = 5.76983e-05 # +7 °C 8
FM2_A4_sx_2  =   0.296918; FM2_A4_sx_err_2  = 0.00371791 # +7 °C 8
FM2_A4_ba_2  =    1911.28; FM2_A4_ba_err_2  =    11.9893 # +7 °C 8
FM2_A4_bs_2  =     9.1365; FM2_A4_bs_err_2  =   0.190101 # +7 °C 8
FM2_A4_ax_3  =    96.4567; FM2_A4_ax_err_3  =    1.31736 # +19 °C 8
FM2_A4_ex_3  =    0.10282; FM2_A4_ex_err_3  = 6.95428e-05 # +19 °C 8
FM2_A4_sx_3  =    0.34744; FM2_A4_sx_err_3  = 0.00453486 # +19 °C 8
FM2_A4_ba_3  =    2110.04; FM2_A4_ba_err_3  =    12.6305 # +19 °C 8
FM2_A4_bs_3  =    8.99729; FM2_A4_bs_err_3  =   0.174874 # +19 °C 8
FM2_A4_ax_4  =    105.264; FM2_A4_ax_err_4  =    1.25031 # +33 °C 8
FM2_A4_ex_4  =   0.102259; FM2_A4_ex_err_4  = 7.88117e-05 # +33 °C 8
FM2_A4_sx_4  =   0.466033; FM2_A4_sx_err_4  = 0.00576025 # +33 °C 8
FM2_A4_ba_4  =    2142.59; FM2_A4_ba_err_4  =    15.8006 # +33 °C 8
FM2_A4_bs_4  = -7.02323e+09; FM2_A4_bs_err_4  = 1.19506e+17 # +33 °C 8
FM2_A4_ax_5  =    45.2717; FM2_A4_ax_err_5  =    1.00489 # +42 °C 8
FM2_A4_ex_5  =   0.106006; FM2_A4_ex_err_5  = 0.000141748 # +42 °C 8
FM2_A4_sx_5  =   0.431115; FM2_A4_sx_err_5  =  0.0109669 # +42 °C 8
FM2_A4_ba_5  =     1460.7; FM2_A4_ba_err_5  =    30.1656 # +42 °C 8
FM2_A4_bs_5  =    5.82216; FM2_A4_bs_err_5  =   0.258171 # +42 °C 8
FM2_A4_ax_6  =    71.4348; FM2_A4_ax_err_6  =     1.0204 # +44 °C 8
FM2_A4_ex_6  =     0.1053; FM2_A4_ex_err_6  = 0.000123872 # +44 °C 8
FM2_A4_sx_6  =    0.58239; FM2_A4_sx_err_6  = 0.00954021 # +44 °C 8
FM2_A4_ba_6  =    2355.19; FM2_A4_ba_err_6  =    14.4142 # +44 °C 8
FM2_A4_bs_6  =    7.84344; FM2_A4_bs_err_6  =   0.128215 # +44 °C 8
FM2_C1_bca_1 =    35.8614; FM2_C1_bca_err_1 =     1.0089 # -7 °C 1
FM2_C1_bcs_1 =    23.2744; FM2_C1_bcs_err_1 =    1.25731 # -7 °C 1
FM2_C1_ac_1  =    41.7121; FM2_C1_ac_err_1  =    2.24267 # -7 °C 1
FM2_C1_ec_1  =   0.104366; FM2_C1_ec_err_1  = 0.000312521 # -7 °C 1
FM2_C1_sc_1  =   0.805325; FM2_C1_sc_err_1  =   0.233892 # -7 °C 1
FM2_C1_bca_2 =     35.236; FM2_C1_bca_err_2 =    1.10311 # +7 °C 1
FM2_C1_bcs_2 =    21.2652; FM2_C1_bcs_err_2 =    1.09128 # +7 °C 1
FM2_C1_ac_2  =    39.2842; FM2_C1_ac_err_2  =    2.38526 # +7 °C 1
FM2_C1_ec_2  =   0.104393; FM2_C1_ec_err_2  = 0.000430784 # +7 °C 1
FM2_C1_sc_2  =     1.2998; FM2_C1_sc_err_2  =   0.330046 # +7 °C 1
FM2_C1_bca_3 =    37.0327; FM2_C1_bca_err_3 =   0.906786 # +19 °C 1
FM2_C1_bcs_3 =     20.537; FM2_C1_bcs_err_3 =   0.869369 # +19 °C 1
FM2_C1_ac_3  =    39.6994; FM2_C1_ac_err_3  =    2.01931 # +19 °C 1
FM2_C1_ec_3  =   0.105339; FM2_C1_ec_err_3  = 0.000183273 # +19 °C 1
FM2_C1_sc_3  =   0.170727; FM2_C1_sc_err_3  =   0.154189 # +19 °C 1
FM2_C1_bca_4 =    43.6321; FM2_C1_bca_err_4 =    0.99171 # +33 °C 1
FM2_C1_bcs_4 =    21.3502; FM2_C1_bcs_err_4 =    0.86941 # +33 °C 1
FM2_C1_ac_4  =    47.9104; FM2_C1_ac_err_4  =    2.19875 # +33 °C 1
FM2_C1_ec_4  =   0.105511; FM2_C1_ec_err_4  = 0.000165307 # +33 °C 1
FM2_C1_sc_4  =   0.171363; FM2_C1_sc_err_4  =   0.076328 # +33 °C 1
FM2_C1_bca_5 =     22.869; FM2_C1_bca_err_5 =   0.902366 # +42 °C 1
FM2_C1_bcs_5 =    23.0584; FM2_C1_bcs_err_5 =    1.52872 # +42 °C 1
FM2_C1_ac_5  =    26.5574; FM2_C1_ac_err_5  =    1.91691 # +42 °C 1
FM2_C1_ec_5  =     0.1063; FM2_C1_ec_err_5  = 0.000535622 # +42 °C 1
FM2_C1_sc_5  =    1.35201; FM2_C1_sc_err_5  =   0.398143 # +42 °C 1
FM2_C1_bca_6 =     42.701; FM2_C1_bca_err_6 =    1.09364 # +44 °C 1
FM2_C1_bcs_6 =    22.2459; FM2_C1_bcs_err_6 =    1.01173 # +44 °C 1
FM2_C1_ac_6  =    47.0133; FM2_C1_ac_err_6  =    2.38494 # +44 °C 1
FM2_C1_ec_6  =   0.105588; FM2_C1_ec_err_6  = 0.000289129 # +44 °C 1
FM2_C1_sc_6  =   0.761234; FM2_C1_sc_err_6  =   0.223655 # +44 °C 1
FM2_C2_bca_1 =    45.3426; FM2_C2_bca_err_1 =    1.30579 # -7 °C 2
FM2_C2_bcs_1 =    23.1395; FM2_C2_bcs_err_1 =    1.29269 # -7 °C 2
FM2_C2_ac_1  =     50.013; FM2_C2_ac_err_1  =    2.94365 # -7 °C 2
FM2_C2_ec_1  =   0.102082; FM2_C2_ec_err_1  = 0.00043569 # -7 °C 2
FM2_C2_sc_1  =     1.6006; FM2_C2_sc_err_1  =   0.336854 # -7 °C 2
FM2_C2_bca_2 =    45.7711; FM2_C2_bca_err_2 =    1.09611 # +7 °C 2
FM2_C2_bcs_2 =    22.1237; FM2_C2_bcs_err_2 =      1.031 # +7 °C 2
FM2_C2_ac_2  =    49.6533; FM2_C2_ac_err_2  =     2.4747 # +7 °C 2
FM2_C2_ec_2  =   0.102629; FM2_C2_ec_err_2  = 0.000264489 # +7 °C 2
FM2_C2_sc_2  =   0.683467; FM2_C2_sc_err_2  =   0.207531 # +7 °C 2
FM2_C2_bca_3 =    46.7249; FM2_C2_bca_err_3 =    1.16718 # +19 °C 2
FM2_C2_bcs_3 =      21.22; FM2_C2_bcs_err_3 =   0.918946 # +19 °C 2
FM2_C2_ac_3  =    51.0134; FM2_C2_ac_err_3  =    2.56979 # +19 °C 2
FM2_C2_ec_3  =    0.10378; FM2_C2_ec_err_3  = 0.000309586 # +19 °C 2
FM2_C2_sc_3  =   0.905784; FM2_C2_sc_err_3  =   0.235322 # +19 °C 2
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FM2_C2_bca_4 =    56.4122; FM2_C2_bca_err_4 =    1.29793 # +33 °C 2
FM2_C2_bcs_4 =    21.2356; FM2_C2_bcs_err_4 =   0.851596 # +33 °C 2
FM2_C2_ac_4  =    56.2209; FM2_C2_ac_err_4  =    2.85921 # +33 °C 2
FM2_C2_ec_4  =    0.10377; FM2_C2_ec_err_4  = 0.000322166 # +33 °C 2
FM2_C2_sc_4  =   0.995272; FM2_C2_sc_err_4  =   0.252176 # +33 °C 2
FM2_C2_bca_5 =    29.7556; FM2_C2_bca_err_5 =   0.818293 # +42 °C 2
FM2_C2_bcs_5 =    23.2703; FM2_C2_bcs_err_5 =    1.35386 # +42 °C 2
FM2_C2_ac_5  =    31.7791; FM2_C2_ac_err_5  =    1.87849 # +42 °C 2
FM2_C2_ec_5  =   0.103315; FM2_C2_ec_err_5  = 0.000213302 # +42 °C 2
FM2_C2_sc_5  =   0.200988; FM2_C2_sc_err_5  =   0.132867 # +42 °C 2
FM2_C2_bca_6 =     54.197; FM2_C2_bca_err_6 =    1.21892 # +44 °C 2
FM2_C2_bcs_6 =    21.6458; FM2_C2_bcs_err_6 =   0.907209 # +44 °C 2
FM2_C2_ac_6  =    52.3085; FM2_C2_ac_err_6  =    2.73079 # +44 °C 2
FM2_C2_ec_6  =   0.103431; FM2_C2_ec_err_6  = 0.000295953 # +44 °C 2
FM2_C2_sc_6  =   0.770518; FM2_C2_sc_err_6  =    0.22319 # +44 °C 2
FM2_C3_bca_1 =    32.0702; FM2_C3_bca_err_1 =     0.9298 # −7 °C 3
FM2_C3_bcs_1 =    15.5586; FM2_C3_bcs_err_1 =   0.521883 # −7 °C 3
FM2_C3_ac_1  =    40.0356; FM2_C3_ac_err_1  =    1.99002 # −7 °C 3
FM2_C3_ec_1  =   0.104218; FM2_C3_ec_err_1  = 0.000266159 # −7 °C 3
FM2_C3_sc_1  =   0.643701; FM2_C3_sc_err_1  =   0.209654 # −7 °C 3
FM2_C3_bca_2 =    31.1211; FM2_C3_bca_err_2 =   0.961848 # +7 °C 3
FM2_C3_bcs_2 =    15.3635; FM2_C3_bcs_err_2 =   0.513087 # +7 °C 3
FM2_C3_ac_2  =    36.9273; FM2_C3_ac_err_2  =    1.99805 # +7 °C 3
FM2_C3_ec_2  =   0.104914; FM2_C3_ec_err_2  = 0.000330867 # +7 °C 3
FM2_C3_sc_2  =   0.824886; FM2_C3_sc_err_2  =   0.248976 # +7 °C 3
FM2_C3_bca_3 =    33.9628; FM2_C3_bca_err_3 =   0.947504 # +19 °C 3
FM2_C3_bcs_3 =    15.4853; FM2_C3_bcs_err_3 =   0.495391 # +19 °C 3
FM2_C3_ac_3  =      39.68; FM2_C3_ac_err_3  =    2.01203 # +19 °C 3
FM2_C3_ec_3  =   0.104466; FM2_C3_ec_err_3  = 0.000270033 # +19 °C 3
FM2_C3_sc_3  =   0.601624; FM2_C3_sc_err_3  =   0.201473 # +19 °C 3
FM2_C3_bca_4 =    40.4367; FM2_C3_bca_err_4 =    1.04911 # +33 °C 3
FM2_C3_bcs_4 =    15.4132; FM2_C3_bcs_err_4 =   0.445624 # +33 °C 3
FM2_C3_ac_4  =    47.9359; FM2_C3_ac_err_4  =     2.2143 # +33 °C 3
FM2_C3_ec_4  =   0.105159; FM2_C3_ec_err_4  = 0.000254212 # +33 °C 3
FM2_C3_sc_4  =   0.661103; FM2_C3_sc_err_4  =   0.196331 # +33 °C 3
FM2_C3_bca_5 =    19.1488; FM2_C3_bca_err_5 =   0.721823 # +42 °C 3
FM2_C3_bcs_5 =    15.5245; FM2_C3_bcs_err_5 =   0.618694 # +42 °C 3
FM2_C3_ac_5  =    25.9999; FM2_C3_ac_err_5  =    1.50217 # +42 °C 3
FM2_C3_ec_5  =   0.105944; FM2_C3_ec_err_5  = 0.000321218 # +42 °C 3
FM2_C3_sc_5  =    0.62133; FM2_C3_sc_err_5  =   0.239432 # +42 °C 3
FM2_C3_bca_6 =    39.8558; FM2_C3_bca_err_6 =    1.10622 # +44 °C 3
FM2_C3_bcs_6 =    16.8628; FM2_C3_bcs_err_6 =   0.547275 # +44 °C 3
FM2_C3_ac_6  =    48.4721; FM2_C3_ac_err_6  =    2.29854 # +44 °C 3
FM2_C3_ec_6  =   0.105843; FM2_C3_ec_err_6  = 0.000312524 # +44 °C 3
FM2_C3_sc_6  =   0.996912; FM2_C3_sc_err_6  =   0.242798 # +44 °C 3
FM2_C4_bca_1 =    66.8527; FM2_C4_bca_err_1 =    1.40326 # −7 °C 4
FM2_C4_bcs_1 =     18.301; FM2_C4_bcs_err_1 =   0.577872 # −7 °C 4
FM2_C4_ac_1  =    49.3537; FM2_C4_ac_err_1  =    2.99344 # −7 °C 4
FM2_C4_ec_1  =   0.103154; FM2_C4_ec_err_1  = 0.000345378 # −7 °C 4
FM2_C4_sc_1  =    0.76306; FM2_C4_sc_err_1  =   0.265561 # −7 °C 4
FM2_C4_bca_2 =    70.1218; FM2_C4_bca_err_2 =    1.46747 # +7 °C 4
FM2_C4_bcs_2 =    19.3259; FM2_C4_bcs_err_2 =     0.6418 # +7 °C 4
FM2_C4_ac_2  =    53.4928; FM2_C4_ac_err_2  =    3.13863 # +7 °C 4
FM2_C4_ec_2  =   0.103248; FM2_C4_ec_err_2  = 0.000356945 # +7 °C 4
FM2_C4_sc_2  =   0.890576; FM2_C4_sc_err_2  =   0.270361 # +7 °C 4
FM2_C4_bca_3 =    77.0875; FM2_C4_bca_err_3 =    2.10572 # +19 °C 4
FM2_C4_bcs_3 =     20.045; FM2_C4_bcs_err_3 =    0.79283 # +19 °C 4
FM2_C4_ac_3  =    67.7668; FM2_C4_ac_err_3  =    4.36343 # +19 °C 4
FM2_C4_ec_3  =   0.102474; FM2_C4_ec_err_3  = 0.000563219 # +19 °C 4
FM2_C4_sc_3  =    2.41952; FM2_C4_sc_err_3  =   0.416227 # +19 °C 4
FM2_C4_bca_4 =    91.5274; FM2_C4_bca_err_4 =    1.63154 # +33 °C 4
FM2_C4_bcs_4 =    20.4009; FM2_C4_bcs_err_4 =   0.614989 # +33 °C 4
FM2_C4_ac_4  =    77.2971; FM2_C4_ac_err_4  =    3.55955 # +33 °C 4
FM2_C4_ec_4  =   0.103966; FM2_C4_ec_err_4  = 0.000274757 # +33 °C 4
FM2_C4_sc_4  =   0.865522; FM2_C4_sc_err_4  =   0.215588 # +33 °C 4
FM2_C4_bca_5 =    44.5323; FM2_C4_bca_err_5 =    1.43135 # +42 °C 4
FM2_C4_bcs_5 =    20.5428; FM2_C4_bcs_err_5 =   0.954855 # +42 °C 4
FM2_C4_ac_5  =     40.789; FM2_C4_ac_err_5  =    2.94481 # +42 °C 4
FM2_C4_ec_5  =   0.104758; FM2_C4_ec_err_5  = 0.000603402 # +42 °C 4
FM2_C4_sc_5  =    1.92556; FM2_C4_sc_err_5  =   0.453318 # +42 °C 4
FM2_C4_bca_6 =    83.9247; FM2_C4_bca_err_6 =    1.90302 # +44 °C 4
FM2_C4_bcs_6 =    20.0785; FM2_C4_bcs_err_6 =     0.6704 # +44 °C 4
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FM2_C4_ac_6  =     70.701; FM2_C4_ac_err_6  =    3.92126 # +44 °C 4
FM2_C4_ec_6  =    0.10406; FM2_C4_ec_err_6  = 0.000437802 # +44 °C 4
FM2_C4_sc_6  =    1.71873; FM2_C4_sc_err_6  =   0.333383 # +44 °C 4
FM2_A1_bca_1 =    118.594; FM2_A1_bca_err_1 =    1.93334 # −7 °C 5
FM2_A1_bcs_1 =    18.8576; FM2_A1_bcs_err_1 =   0.535644 # −7 °C 5
FM2_A1_ac_1  =    118.208; FM2_A1_ac_err_1  =    4.44272 # −7 °C 5
FM2_A1_ec_1  =  0.0992967; FM2_A1_ec_err_1  = 0.000228616 # −7 °C 5
FM2_A1_sc_1  =     1.0814; FM2_A1_sc_err_1  =    0.18319 # −7 °C 5
FM2_A1_bca_2 =    119.758; FM2_A1_bca_err_2 =    1.94197 # +7 °C 5
FM2_A1_bcs_2 =    18.9021; FM2_A1_bcs_err_2 =   0.530593 # +7 °C 5
FM2_A1_ac_2  =    124.318; FM2_A1_ac_err_2  =    4.44288 # +7 °C 5
FM2_A1_ec_2  =  0.0993399; FM2_A1_ec_err_2  = 0.000218843 # +7 °C 5
FM2_A1_sc_2  =    1.05956; FM2_A1_sc_err_2  =   0.169489 # +7 °C 5
FM2_A1_bca_3 =    131.427; FM2_A1_bca_err_3 =     1.8434 # +19 °C 5
FM2_A1_bcs_3 =    18.7485; FM2_A1_bcs_err_3 =   0.479335 # +19 °C 5
FM2_A1_ac_3  =     129.24; FM2_A1_ac_err_3  =    4.30265 # +19 °C 5
FM2_A1_ec_3  =  0.0994726; FM2_A1_ec_err_3  = 0.000161365 # +19 °C 5
FM2_A1_sc_3  =    0.60828; FM2_A1_sc_err_3  =   0.123792 # +19 °C 5
FM2_A1_bca_4 =    160.031; FM2_A1_bca_err_4 =    2.07767 # +33 °C 5
FM2_A1_bcs_4 =    19.8436; FM2_A1_bcs_err_4 =    0.49372 # +33 °C 5
FM2_A1_ac_4  =    160.191; FM2_A1_ac_err_4  =    4.85771 # +33 °C 5
FM2_A1_ec_4  =  0.0997337; FM2_A1_ec_err_4  = 0.000157506 # +33 °C 5
FM2_A1_sc_4  =   0.724117; FM2_A1_sc_err_4  =   0.121856 # +33 °C 5
FM2_A1_bca_5 =    76.6291; FM2_A1_bca_err_5 =    1.58181 # +42 °C 5
FM2_A1_bcs_5 =    18.6749; FM2_A1_bcs_err_5 =     0.6367 # +42 °C 5
FM2_A1_ac_5  =    79.8403; FM2_A1_ac_err_5  =     3.5532 # +42 °C 5
FM2_A1_ec_5  =   0.100073; FM2_A1_ec_err_5  = 0.000279453 # +42 °C 5
FM2_A1_sc_5  =    1.09406; FM2_A1_sc_err_5  =   0.212445 # +42 °C 5
FM2_A1_bca_6 =    144.454; FM2_A1_bca_err_6 =    2.06734 # +44 °C 5
FM2_A1_bcs_6 =    18.5293; FM2_A1_bcs_err_6 =   0.449972 # +44 °C 5
FM2_A1_ac_6  =    138.971; FM2_A1_ac_err_6  =    4.70337 # +44 °C 5
FM2_A1_ec_6  =   0.100154; FM2_A1_ec_err_6  = 0.000193557 # +44 °C 5
FM2_A1_sc_6  =   0.884649; FM2_A1_sc_err_6  =   0.150419 # +44 °C 5
FM2_A2_bca_1 =    142.183; FM2_A2_bca_err_1 =     2.1165 # −7 °C 6
FM2_A2_bcs_1 =    22.1226; FM2_A2_bcs_err_1 =   0.602243 # −7 °C 6
FM2_A2_ac_1  =    137.314; FM2_A2_ac_err_1  =    4.67874 # −7 °C 6
FM2_A2_ec_1  =   0.103735; FM2_A2_ec_err_1  = 0.00022829 # −7 °C 6
FM2_A2_sc_1  =     1.1763; FM2_A2_sc_err_1  =   0.180111 # −7 °C 6
FM2_A2_bca_2 =    148.036; FM2_A2_bca_err_2 =    2.12944 # +7 °C 6
FM2_A2_bcs_2 =    24.3276; FM2_A2_bcs_err_2 =   0.704888 # +7 °C 6
FM2_A2_ac_2  =    150.923; FM2_A2_ac_err_2  =    4.71595 # +7 °C 6
FM2_A2_ec_2  =   0.104474; FM2_A2_ec_err_2  = 0.000208427 # +7 °C 6
FM2_A2_sc_2  =    1.12981; FM2_A2_sc_err_2  =   0.160446 # +7 °C 6
FM2_A2_bca_3 =    157.855; FM2_A2_bca_err_3 =    2.12061 # +19 °C 6
FM2_A2_bcs_3 =     22.697; FM2_A2_bcs_err_3 =   0.574924 # +19 °C 6
FM2_A2_ac_3  =    150.871; FM2_A2_ac_err_3  =    4.68013 # +19 °C 6
FM2_A2_ec_3  =   0.104641; FM2_A2_ec_err_3  = 0.000189626 # +19 °C 6
FM2_A2_sc_3  =   0.905634; FM2_A2_sc_err_3  =   0.145119 # +19 °C 6
FM2_A2_bca_4 =    187.717; FM2_A2_bca_err_4 =    2.38258 # +33 °C 6
FM2_A2_bcs_4 =    22.9884; FM2_A2_bcs_err_4 =    0.54178 # +33 °C 6
FM2_A2_ac_4  =    177.741; FM2_A2_ac_err_4  =      5.208 # +33 °C 6
FM2_A2_ec_4  =   0.105106; FM2_A2_ec_err_4  = 0.000192126 # +33 °C 6
FM2_A2_sc_4  =    1.05999; FM2_A2_sc_err_4  =   0.147838 # +33 °C 6
FM2_A2_bca_5 =    94.2507; FM2_A2_bca_err_5 =    1.42065 # +42 °C 6
FM2_A2_bcs_5 =    20.8172; FM2_A2_bcs_err_5 =    0.57861 # +42 °C 6
FM2_A2_ac_5  =    80.9506; FM2_A2_ac_err_5  =    3.25896 # +42 °C 6
FM2_A2_ec_5  =   0.105093; FM2_A2_ec_err_5  =  0.0001323 # +42 °C 6
FM2_A2_sc_5  =   0.201643; FM2_A2_sc_err_5  =   0.176661 # +42 °C 6
FM2_A2_bca_6 =    177.859; FM2_A2_bca_err_6 =    2.21286 # +44 °C 6
FM2_A2_bcs_6 =    22.2391; FM2_A2_bcs_err_6 =   0.507475 # +44 °C 6
FM2_A2_ac_6  =    160.335; FM2_A2_ac_err_6  =     4.8585 # +44 °C 6
FM2_A2_ec_6  =   0.105245; FM2_A2_ec_err_6  = 0.000175867 # +44 °C 6
FM2_A2_sc_6  =   0.799012; FM2_A2_sc_err_6  =   0.135454 # +44 °C 6
FM2_A3_bca_1 =    121.789; FM2_A3_bca_err_1 =    1.80522 # −7 °C 7
FM2_A3_bcs_1 =    16.1484; FM2_A3_bcs_err_1 =   0.314459 # −7 °C 7
FM2_A3_ac_1  =    128.639; FM2_A3_ac_err_1  =    3.92132 # −7 °C 7
FM2_A3_ec_1  =   0.102486; FM2_A3_ec_err_1  = 0.000164045 # −7 °C 7
FM2_A3_sc_1  =   0.648335; FM2_A3_sc_err_1  =   0.119582 # −7 °C 7
FM2_A3_bca_2 =    124.507; FM2_A3_bca_err_2 =    2.02105 # +7 °C 7
FM2_A3_bcs_2 =    16.0205; FM2_A3_bcs_err_2 =   0.315678 # +7 °C 7
FM2_A3_ac_2  =    132.239; FM2_A3_ac_err_2  =    4.25702 # +7 °C 7
FM2_A3_ec_2  =   0.102727; FM2_A3_ec_err_2  = 0.000212383 # +7 °C 7
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FM2_A3_sc_2  =     1.08113; FM2_A3_sc_err_2  =    0.162131 # +7 °C 7
FM2_A3_bca_3 =     130.826; FM2_A3_bca_err_3 =      2.0911 # +19 °C 7
FM2_A3_bcs_3 =     15.4546; FM2_A3_bcs_err_3 =    0.283175 # +19 °C 7
FM2_A3_ac_3  =     130.722; FM2_A3_ac_err_3  =      4.3365 # +19 °C 7
FM2_A3_ec_3  =    0.102825; FM2_A3_ec_err_3  = 0.000220172 # +19 °C 7
FM2_A3_sc_3  =     1.08548; FM2_A3_sc_err_3  =    0.168708 # +19 °C 7
FM2_A3_bca_4 =     153.891; FM2_A3_bca_err_4 =     2.26912 # +33 °C 7
FM2_A3_bcs_4 =     15.6851; FM2_A3_bcs_err_4 =    0.262735 # +33 °C 7
FM2_A3_ac_4  =      157.82; FM2_A3_ac_err_4  =     4.69083 # +33 °C 7
FM2_A3_ec_4  =    0.103566; FM2_A3_ec_err_4  = 0.000201819 # +33 °C 7
FM2_A3_sc_4  =      1.1289; FM2_A3_sc_err_4  =    0.154618 # +33 °C 7
FM2_A3_bca_5 =     78.2751; FM2_A3_bca_err_5 =     1.61279 # +42 °C 7
FM2_A3_bcs_5 =     15.6949; FM2_A3_bcs_err_5 =    0.367193 # +42 °C 7
FM2_A3_ac_5  =      83.483; FM2_A3_ac_err_5  =     3.34498 # +42 °C 7
FM2_A3_ec_5  =    0.103613; FM2_A3_ec_err_5  = 0.000270357 # +42 °C 7
FM2_A3_sc_5  =     1.10949; FM2_A3_sc_err_5  =    0.204995 # +42 °C 7
FM2_A3_bca_6 =     145.972; FM2_A3_bca_err_6 =      2.1815 # +44 °C 7
FM2_A3_bcs_6 =     15.7172; FM2_A3_bcs_err_6 =    0.271053 # +44 °C 7
FM2_A3_ac_6  =     146.925; FM2_A3_ac_err_6  =     4.52855 # +44 °C 7
FM2_A3_ec_6  =    0.103599; FM2_A3_ec_err_6  = 0.000202383 # +44 °C 7
FM2_A3_sc_6  =     1.03232; FM2_A3_sc_err_6  =    0.152311 # +44 °C 7
FM2_A4_bca_1 =     233.026; FM2_A4_bca_err_1 =     3.62954 # −7 °C 8
FM2_A4_bcs_1 =     21.1464; FM2_A4_bcs_err_1 =      0.5286 # −7 °C 8
FM2_A4_ac_1  =     203.717; FM2_A4_ac_err_1  =     7.75176 # −7 °C 8
FM2_A4_ec_1  =    0.101951; FM2_A4_ec_err_1  = 0.000329628 # −7 °C 8
FM2_A4_sc_1  =     2.47992; FM2_A4_sc_err_1  =    0.244259 # −7 °C 8
FM2_A4_bca_2 =     233.816; FM2_A4_bca_err_2 =     3.16991 # +7 °C 8
FM2_A4_bcs_2 =      21.136; FM2_A4_bcs_err_2 =    0.462734 # +7 °C 8
FM2_A4_ac_2  =     202.216; FM2_A4_ac_err_2  =     6.70645 # +7 °C 8
FM2_A4_ec_2  =    0.103425; FM2_A4_ec_err_2  = 0.000264789 # +7 °C 8
FM2_A4_sc_2  =     1.81147; FM2_A4_sc_err_2  =    0.199275 # +7 °C 8
FM2_A4_bca_3 =     257.187; FM2_A4_bca_err_3 =      4.0316 # +19 °C 8
FM2_A4_bcs_3 =     22.0593; FM2_A4_bcs_err_3 =    0.565197 # +19 °C 8
FM2_A4_ac_3  =     242.237; FM2_A4_ac_err_3  =     8.75985 # +19 °C 8
FM2_A4_ec_3  =    0.102523; FM2_A4_ec_err_3  = 0.000328505 # +19 °C 8
FM2_A4_sc_3  =     2.88475; FM2_A4_sc_err_3  =    0.242796 # +19 °C 8
FM2_A4_bca_4 =     302.395; FM2_A4_bca_err_4 =     4.51633 # +33 °C 8
FM2_A4_bcs_4 =     21.8641; FM2_A4_bcs_err_4 =    0.505215 # +33 °C 8
FM2_A4_ac_4  =     276.536; FM2_A4_ac_err_4  =     9.59159 # +33 °C 8
FM2_A4_ec_4  =    0.103277; FM2_A4_ec_err_4  = 0.000323069 # +33 °C 8
FM2_A4_sc_4  =     3.01785; FM2_A4_sc_err_4  =     0.23988 # +33 °C 8
FM2_A4_bca_5 =     146.189; FM2_A4_bca_err_5 =     2.66991 # +42 °C 8
FM2_A4_bcs_5 =     20.0484; FM2_A4_bcs_err_5 =     0.51735 # +42 °C 8
FM2_A4_ac_5  =     126.528; FM2_A4_ac_err_5  =     5.45014 # +42 °C 8
FM2_A4_ec_5  =    0.104199; FM2_A4_ec_err_5  = 0.000363307 # +42 °C 8
FM2_A4_sc_5  =     2.02997; FM2_A4_sc_err_5  =    0.271714 # +42 °C 8
FM2_A4_bca_6 =     282.174; FM2_A4_bca_err_6 =     3.85088 # +44 °C 8
FM2_A4_bcs_6 =     21.0811; FM2_A4_bcs_err_6 =    0.440414 # +44 °C 8
FM2_A4_ac_6  =     248.144; FM2_A4_ac_err_6  =     8.05147 # +44 °C 8
FM2_A4_ec_6  =    0.103527; FM2_A4_ec_err_6  = 0.000281062 # +44 °C 8
FM2_A4_sc_6  =     2.30399; FM2_A4_sc_err_6  =    0.210025 # +44 °C 8
FM2_C1_ee0 =    0.103411; FM2_C1_ee0_err = 7.10923e−05
FM2_C1_ee1 =    0.110276; FM2_C1_ee1_err = 0.00678864
FM2_C1_ee2 =    −14.8414; FM2_C1_ee2_err =     1.96764
FM2_C2_ee0 =    0.101685; FM2_C2_ee0_err = 8.20879e−05
FM2_C2_ee1 =    0.177646; FM2_C2_ee1_err = 0.00829676
FM2_C2_ee2 =    −35.1118; FM2_C2_ee2_err =     2.18359
FM2_C3_ee0 =    0.104591; FM2_C3_ee0_err = 6.39173e−05
FM2_C3_ee1 =   −0.121237; FM2_C3_ee1_err = 0.00616619
FM2_C3_ee2 =     34.8429; FM2_C3_ee2_err =     1.52124
FM2_C4_ee0 =       0.104; FM2_C4_ee0_err = 8.29694e−05
FM2_C4_ee1 =  0.0223096; FM2_C4_ee1_err = 0.00954863
FM2_C4_ee2 =     1.06341; FM2_C4_ee2_err =      2.2803
FM2_A1_ee0 =  0.0986634; FM2_A1_ee0_err = 5.62354e−05
FM2_A1_ee1 =  0.0105366; FM2_A1_ee1_err = 0.00595194
FM2_A1_ee2 =     1.18142; FM2_A1_ee2_err =     1.60161
FM2_A2_ee0 =    0.102689; FM2_A2_ee0_err = 5.13883e−05
FM2_A2_ee1 =    0.036935; FM2_A2_ee1_err = 0.00553956
FM2_A2_ee2 =     5.73738; FM2_A2_ee2_err =     1.40343
FM2_A3_ee0 =    0.102536; FM2_A3_ee0_err = 6.12521e−05
FM2_A3_ee1 =  0.0325866; FM2_A3_ee1_err = 0.00671099
FM2_A3_ee2 =    −2.85676; FM2_A3_ee2_err =     1.61508
FM2_A4_ee0 =     0.10269; FM2_A4_ee0_err = 3.86747e−05
FM2_A4_ee1 = −0.0155112; FM2_A4_ee1_err = 0.00415271
FM2_A4_ee2 =     12.5094; FM2_A4_ee2_err =     1.13137
FM2_EPT_e0 =    0.999461; FM2_EPT_e0_err = 1.99473e−05
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FM2_EPT_e1 =  0.0145266; FM2_EPT_e1_err = 0.000214546
FM2_EPT_e2 =    5.11129; FM2_EPT_e2_err =  0.0555827
FM2_C1H_ax_1  =     32.156; FM2_C1H_ax_err_1  =    0.334438 # -7 °C
FM2_C1H_ex_1  =    0.61138; FM2_C1H_ex_err_1  = 0.000234345 # -7 °C
FM2_C1H_sx_1  =    1.60266; FM2_C1H_sx_err_1  =   0.0155412 # -7 °C
FM2_C1H_ab_1  =    6.89234; FM2_C1H_ab_err_1  =    0.129935 # -7 °C
FM2_C1H_ba_1  =  0.0556329; FM2_C1H_ba_err_1  =    0.103964 # -7 °C
FM2_C1H_bs_1  =    2.89555; FM2_C1H_bs_err_1  =    0.763799 # -7 °C
FM2_C1H_bca_1 =     84.971; FM2_C1H_bca_err_1 =    0.750296 # -7 °C
FM2_C1H_bcs_1 =    124.389; FM2_C1H_bcs_err_1 =    0.832908 # -7 °C
FM2_C1H_ac_1  =     43.629; FM2_C1H_ac_err_1  =     1.21318 # -7 °C
FM2_C1H_ec_1  =   0.609083; FM2_C1H_ec_err_1  = 0.00129712 # -7 °C
FM2_C1H_sc_1  =    6.37485; FM2_C1H_sc_err_1  =     1.00051 # -7 °C
FM2_C1H_ax_2  =    28.5137; FM2_C1H_ax_err_2  =    0.304089 # +7 °C
FM2_C1H_ex_2  =   0.619595; FM2_C1H_ex_err_2  = 0.000265408 # +7 °C
FM2_C1H_sx_2  =    1.73355; FM2_C1H_sx_err_2  =    0.017147 # +7 °C
FM2_C1H_ab_2  =    6.24951; FM2_C1H_ab_err_2  =    0.151215 # +7 °C
FM2_C1H_ba_2  =   0.965926; FM2_C1H_ba_err_2  =     1.32894 # +7 °C
FM2_C1H_bs_2  =    5.14376; FM2_C1H_bs_err_2  =     1.77062 # +7 °C
FM2_C1H_bca_2 =    80.3083; FM2_C1H_bca_err_2 =    0.750405 # +7 °C
FM2_C1H_bcs_2 =    126.158; FM2_C1H_bcs_err_2 =    0.890512 # +7 °C
FM2_C1H_ac_2  =    39.4851; FM2_C1H_ac_err_2  =     1.19874 # +7 °C
FM2_C1H_ec_2  =   0.613611; FM2_C1H_ec_err_2  = 0.00140023 # +7 °C
FM2_C1H_sc_2  =    6.36326; FM2_C1H_sc_err_2  =     1.07338 # +7 °C
FM2_C1H_ax_3  =    27.7698; FM2_C1H_ax_err_3  =    0.295386 # +19 °C
FM2_C1H_ex_3  =   0.622747; FM2_C1H_ex_err_3  = 0.000288915 # +19 °C
FM2_C1H_sx_3  =    1.84099; FM2_C1H_sx_err_3  =   0.0183288 # +19 °C
FM2_C1H_ab_3  =    6.78363; FM2_C1H_ab_err_3  =    0.127796 # +19 °C
FM2_C1H_ba_3  =   0.028766; FM2_C1H_ba_err_3  =   0.0728451 # +19 °C
FM2_C1H_bs_3  =    2.86356; FM2_C1H_bs_err_3  =    0.970344 # +19 °C
FM2_C1H_bca_3 =    83.4714; FM2_C1H_bca_err_3 =    0.726801 # +19 °C
FM2_C1H_bcs_3 =    127.217; FM2_C1H_bcs_err_3 =    0.842169 # +19 °C
FM2_C1H_ac_3  =    44.8815; FM2_C1H_ac_err_3  =     1.21223 # +19 °C
FM2_C1H_ec_3  =   0.621713; FM2_C1H_ec_err_3  = 0.00117571 # +19 °C
FM2_C1H_sc_3  =    5.67267; FM2_C1H_sc_err_3  =    0.904418 # +19 °C
FM2_C1H_ax_4  =    27.5909; FM2_C1H_ax_err_4  =    0.279697 # +33 °C
FM2_C1H_ex_4  =   0.623605; FM2_C1H_ex_err_4  = 0.000349277 # +33 °C
FM2_C1H_sx_4  =    2.20352; FM2_C1H_sx_err_4  =   0.0216008 # +33 °C
FM2_C1H_ab_4  =    7.42337; FM2_C1H_ab_err_4  =    0.139342 # +33 °C
FM2_C1H_ba_4  =  0.0299323; FM2_C1H_ba_err_4  =   0.0816159 # +33 °C
FM2_C1H_bs_4  =     2.8983; FM2_C1H_bs_err_4  =     1.06744 # +33 °C
FM2_C1H_bca_4 =    96.2798; FM2_C1H_bca_err_4 =    0.782486 # +33 °C
FM2_C1H_bcs_4 =    128.758; FM2_C1H_bcs_err_4 =    0.820689 # +33 °C
FM2_C1H_ac_4  =    50.9977; FM2_C1H_ac_err_4  =     1.30443 # +33 °C
FM2_C1H_ec_4  =   0.620372; FM2_C1H_ec_err_4  = 0.00111684 # +33 °C
FM2_C1H_sc_4  =    5.75397; FM2_C1H_sc_err_4  =    0.863328 # +33 °C
FM2_C1H_ax_5  =    12.4811; FM2_C1H_ax_err_5  =    0.183976 # +42 °C
FM2_C1H_ex_5  =   0.622956; FM2_C1H_ex_err_5  = 0.000607476 # +42 °C
FM2_C1H_sx_5  =    2.51923; FM2_C1H_sx_err_5  =   0.0379395 # +42 °C
FM2_C1H_ab_5  =    3.62057; FM2_C1H_ab_err_5  =    0.115193 # +42 °C
FM2_C1H_ba_5  =   0.292215; FM2_C1H_ba_err_5  =     0.52198 # +42 °C
FM2_C1H_bs_5  =     4.3706; FM2_C1H_bs_err_5  =      1.6266 # +42 °C
FM2_C1H_bca_5 =    48.9531; FM2_C1H_bca_err_5 =    0.512534 # +42 °C
FM2_C1H_bcs_5 =    127.236; FM2_C1H_bcs_err_5 =     1.12836 # +42 °C
FM2_C1H_ac_5  =    24.7989; FM2_C1H_ac_err_5  =    0.900763 # +42 °C
FM2_C1H_ec_5  =   0.618964; FM2_C1H_ec_err_5  = 0.00132417 # +42 °C
FM2_C1H_sc_5  =    3.89001; FM2_C1H_sc_err_5  =     1.02281 # +42 °C
FM2_C1H_ax_6  =    20.4887; FM2_C1H_ax_err_6  =    0.233728 # +44 °C
FM2_C1H_ex_6  =    0.62156; FM2_C1H_ex_err_6  = 0.000518067 # +44 °C
FM2_C1H_sx_6  =    2.70789; FM2_C1H_sx_err_6  =   0.0327159 # +44 °C
FM2_C1H_ab_6  =     5.9572; FM2_C1H_ab_err_6  =    0.144124 # +44 °C
FM2_C1H_ba_6  =  0.0482648; FM2_C1H_ba_err_6  =    0.114906 # +44 °C
FM2_C1H_bs_6  =    3.05456; FM2_C1H_bs_err_6  =     1.04464 # +44 °C
FM2_C1H_bca_6 =      86.56; FM2_C1H_bca_err_6 =    0.835919 # +44 °C
FM2_C1H_bcs_6 =    127.115; FM2_C1H_bcs_err_6 =    0.870913 # +44 °C
FM2_C1H_ac_6  =    45.5473; FM2_C1H_ac_err_6  =      1.3019 # +44 °C
FM2_C1H_ec_6  =   0.618681; FM2_C1H_ec_err_6  = 0.00144471 # +44 °C
FM2_C1H_sc_6  =    7.86117; FM2_C1H_sc_err_6  =     1.08788 # +44 °C
FM2_C1H_ee0  =   0.615758; FM2_C1H_ee0_err  = 0.000160657
FM2_C1H_ee1  = 0.000558514; FM2_C1H_ee1_err  = 1.73917e-05
FM2_C1H_ee2  = -9.84276e-06; FM2_C1H_ee2_err  = 4.87436e-07
FM2_BB_C_e_1  =     1179.24; FM2_BB_C_e_err_1  =     18.8057 # -7 °C
FM2_BB_C_a_1  =     38.8255; FM2_BB_C_a_err_1  =     5.62365 # -7 °C
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580  FM2_BB_C_s_1  =     87.6747; FM2_BB_C_s_err_1  =     13.6728 # -7 °C
581  FM2_BB_C_e_2  =     1023.06; FM2_BB_C_e_err_2  =     12.9447 # +7 °C
582  FM2_BB_C_a_2  =     52.7739; FM2_BB_C_a_err_2  =     6.76829 # +7 °C
583  FM2_BB_C_s_2  =     68.9399; FM2_BB_C_s_err_2  =     9.22853 # +7 °C
584  FM2_BB_C_e_3  =     935.209; FM2_BB_C_e_err_3  =     15.2147 # +19 °C
585  FM2_BB_C_a_3  =     47.7055; FM2_BB_C_a_err_3  =     6.15153 # +19 °C
586  FM2_BB_C_s_3  =     78.7558; FM2_BB_C_s_err_3  =     10.7689 # +19 °C
587  FM2_BB_C_e_4  =     796.757; FM2_BB_C_e_err_4  =     9.47298 # +33 °C
588  FM2_BB_C_a_4  =     75.9696; FM2_BB_C_a_err_4  =     7.61107 # +33 °C
589  FM2_BB_C_s_4  =      64.872; FM2_BB_C_s_err_4  =     6.50842 # +33 °C
590  FM2_BB_C_e_5  =     685.597; FM2_BB_C_e_err_5  =     11.2232 # +42 °C
591  FM2_BB_C_a_5  =     50.5746; FM2_BB_C_a_err_5  =     8.04503 # +42 °C
592  FM2_BB_C_s_5  =     48.5026; FM2_BB_C_s_err_5  =     8.11162 # +42 °C
593  FM2_BB_C_e_6  =     653.279; FM2_BB_C_e_err_6  =     7.75298 # +44 °C
594  FM2_BB_C_a_6  =     88.0918; FM2_BB_C_a_err_6  =     8.71005 # +44 °C
595  FM2_BB_C_s_6  =     55.1254; FM2_BB_C_s_err_6  =     5.39657 # +44 °C
596  GPFUN_FM2_BGO_cal="FM2_BGO_cal(T) = FM2_BGO_BB0*(1-T*(FM2_BGO_BB1+T*(FM2_BGO_BB2/1e4)))"
597  FM2_BGO_BB0 =     1102.79 ; FM2_BGO_BB0_err =     10.8566
598  FM2_BGO_BB1 = 0.00748574 ; FM2_BGO_BB1_err = 0.000857398
599  FM2_BGO_BB2 =     0.33965 ; FM2_BGO_BB2_err =    0.189273
600  FM2_ABBA_C_a =     52.8872; FM2_ABBA_C_a_err =     7.33472
601  FM2_ABBA_C_e =  0.0574571; FM2_ABBA_C_e_err = 0.000781736
602  FM2_ABBA_C_s =     75.8864; FM2_ABBA_C_s_err =     9.56679
603  FM2_C2H_C1H_ratio_1  =    0.950965; FM2_C2H_C1H_ratio_err_1  = 3.55142e-09 # -7 °C
604  FM2_C2H_C1H_ratio_2  =    0.945917; FM2_C2H_C1H_ratio_err_2  = 4.50616e-09 # +7 °C
605  FM2_C2H_C1H_ratio_3  =    0.889063; FM2_C2H_C1H_ratio_err_3  = 1.2823e-08 # +19 °C
606  FM2_C2H_C1H_ratio_4  =    0.982573; FM2_C2H_C1H_ratio_err_4  = 5.94203e-09 # +33 °C
607  FM2_C2H_C1H_ratio_5  =    0.990663; FM2_C2H_C1H_ratio_err_5  = 9.81545e-09 # +42 °C
608  FM2_C2H_C1H_ratio_6  =    0.985328; FM2_C2H_C1H_ratio_err_6  = 7.63854e-09 # +44 °C
609  FM2_C1L_ratio_1  =     13.7855; FM2_C1L_ratio_err_1  = 3.0387e-07 # -7 °C
610  FM2_C1L_ratio_2  =      13.965; FM2_C1L_ratio_err_2  = 2.75645e-07 # +7 °C
611  FM2_C1L_ratio_3  =     14.0193; FM2_C1L_ratio_err_3  = 1.21154e-06 # +19 °C
612  FM2_C1L_ratio_4  =     13.9354; FM2_C1L_ratio_err_4  = 1.95674e-07 # +33 °C
613  FM2_C1L_ratio_5  =     13.9421; FM2_C1L_ratio_err_5  = 4.42935e-07 # +42 °C
614  FM2_C1L_ratio_6  =     13.8928; FM2_C1L_ratio_err_6  = 3.98713e-07 # +44 °C
615  FM2_C2L_ratio_1  =     13.7418; FM2_C2L_ratio_err_1  = 1.82458e-07 # -7 °C
616  FM2_C2L_ratio_2  =     13.9059; FM2_C2L_ratio_err_2  = 2.90007e-07 # +7 °C
617  FM2_C2L_ratio_3  =     13.9486; FM2_C2L_ratio_err_3  = 1.20739e-06 # +19 °C
618  FM2_C2L_ratio_4  =     13.9773; FM2_C2L_ratio_err_4  = 3.13295e-07 # +33 °C
619  FM2_C2L_ratio_5  =      13.868; FM2_C2L_ratio_err_5  = 4.64099e-07 # +42 °C
620  FM2_C2L_ratio_6  =     13.8422; FM2_C2L_ratio_err_6  = 3.95346e-07 # +44 °C
621  GPFUN_FM2_BGO_HL_cal="FM2_BGO_HL_cal(T) = FM2_BGO_HL0*(1 + T*(FM2_BGO_HL1 + T*(
         FM2_BGO_HL2)))"
622  FM2_BGO_HL0 =     13.8538 ; FM2_BGO_HL0_err = 1.24528e-07
623  FM2_BGO_HL1 = 0.000864494 ; FM2_BGO_HL1_err = 1.01628e-09
624  FM2_BGO_HL2 = -1.92661e-05 ; FM2_BGO_HL2_err = 2.85812e-11
625  FM2_A11H_ax_1  =      20.609; FM2_A11H_ax_err_1  =    0.658166 # -7 °C 1
626  FM2_A11H_ex_1  =  0.0729235; FM2_A11H_ex_err_1  = 0.000234383 # -7 °C 1
627  FM2_A11H_sx_1  =   0.470931; FM2_A11H_sx_err_1  =   0.0188312 # -7 °C 1
628  FM2_A11H_ba_1  =     1052.5; FM2_A11H_ba_err_1  =      13.155 # -7 °C 1
629  FM2_A11H_bs_1  =     12.4835; FM2_A11H_bs_err_1  =    0.975526 # -7 °C 1
630  FM2_A11H_ax_2  =     34.2096; FM2_A11H_ax_err_2  =    0.996119 # +7 °C 1
631  FM2_A11H_ex_2  =  0.0771257; FM2_A11H_ex_err_2  = 9.16742e-05 # +7 °C 1
632  FM2_A11H_sx_2  =   0.211298; FM2_A11H_sx_err_2  = 0.00597502 # +7 °C 1
633  FM2_A11H_ba_2  =     938.321; FM2_A11H_ba_err_2  =     10.5426 # +7 °C 1
634  FM2_A11H_bs_2  =     12.1928; FM2_A11H_bs_err_2  =     0.89459 # +7 °C 1
635  FM2_A11H_ax_3  =     19.5116; FM2_A11H_ax_err_3  =    0.611151 # +19 °C 1
636  FM2_A11H_ex_3  =  0.0759732; FM2_A11H_ex_err_3  = 0.00025001 # +19 °C 1
637  FM2_A11H_sx_3  =   0.513184; FM2_A11H_sx_err_3  =   0.0210062 # +19 °C 1
638  FM2_A11H_ba_3  =     983.699; FM2_A11H_ba_err_3  =     14.0026 # +19 °C 1
639  FM2_A11H_bs_3  =     11.0721; FM2_A11H_bs_err_3  =    0.824409 # +19 °C 1
640  FM2_A11H_ax_4  =     28.9747; FM2_A11H_ax_err_4  =    0.872884 # +33 °C 1
641  FM2_A11H_ex_4  =  0.0739737; FM2_A11H_ex_err_4  = 0.000157108 # +33 °C 1
642  FM2_A11H_sx_4  =   0.337256; FM2_A11H_sx_err_4  =    0.011023 # +33 °C 1
643  FM2_A11H_ba_4  =     1161.26; FM2_A11H_ba_err_4  =     12.1706 # +33 °C 1
644  FM2_A11H_bs_4  =     11.6158; FM2_A11H_bs_err_4  =    0.750706 # +33 °C 1
645  FM2_A11H_ax_5  =     17.4533; FM2_A11H_ax_err_5  =    0.670031 # +42 °C 1
646  FM2_A11H_ex_5  =  0.0752246; FM2_A11H_ex_err_5  = 0.000175313 # +42 °C 1
647  FM2_A11H_sx_5  =   0.289596; FM2_A11H_sx_err_5  =   0.0113838 # +42 °C 1
648  FM2_A11H_ba_5  =     575.667; FM2_A11H_ba_err_5  =     8.43511 # +42 °C 1
649  FM2_A11H_bs_5  =     13.2058; FM2_A11H_bs_err_5  =     1.36295 # +42 °C 1
650  FM2_A11H_ax_6  =      31.847; FM2_A11H_ax_err_6  =    0.923937 # +44 °C 1
651  FM2_A11H_ex_6  =  0.0761906; FM2_A11H_ex_err_6  = 0.000121435 # +44 °C 1
652  FM2_A11H_sx_6  =   0.270932; FM2_A11H_sx_err_6  = 0.00792059 # +44 °C 1
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FM2_A11H_ba_6  =     993.79; FM2_A11H_ba_err_6  =    11.1719 # +44 °C 1
FM2_A11H_bs_6  =    11.1978; FM2_A11H_bs_err_6  =   0.749621 # +44 °C 1
FM2_A12H_ax_1  =    127.496; FM2_A12H_ax_err_1  =    1.92991 # −7 °C 2
FM2_A12H_ex_1  =  0.0770621; FM2_A12H_ex_err_1  = 5.29828e−05 # −7 °C 2
FM2_A12H_sx_1  =    0.23448; FM2_A12H_sx_err_1  = 0.00352733 # −7 °C 2
FM2_A12H_ba_1  =     3945.4; FM2_A12H_ba_err_1  =    21.8268 # −7 °C 2
FM2_A12H_bs_1  =    12.0581; FM2_A12H_bs_err_1  =   0.429256 # −7 °C 2
FM2_A12H_ax_2  =    73.8954; FM2_A12H_ax_err_2  =    1.30249 # +7 °C 2
FM2_A12H_ex_2  =  0.0767726; FM2_A12H_ex_err_2  = 0.000120881 # +7 °C 2
FM2_A12H_sx_2  =   0.450296; FM2_A12H_sx_err_2  = 0.00975674 # +7 °C 2
FM2_A12H_ba_2  =    3615.13; FM2_A12H_ba_err_2  =    25.0175 # +7 °C 2
FM2_A12H_bs_2  =    11.4229; FM2_A12H_bs_err_2  =   0.442544 # +7 °C 2
FM2_A12H_ax_3  =    73.7173; FM2_A12H_ax_err_3  =    1.22154 # +19 °C 2
FM2_A12H_ex_3  =  0.076855; FM2_A12H_ex_err_3  = 0.000128288 # +19 °C 2
FM2_A12H_sx_3  =   0.501356; FM2_A12H_sx_err_3  =  0.0108061 # +19 °C 2
FM2_A12H_ba_3  =    3769.62; FM2_A12H_ba_err_3  =    27.6824 # +19 °C 2
FM2_A12H_bs_3  =    11.6044; FM2_A12H_bs_err_3  =   0.466798 # +19 °C 2
FM2_A12H_ax_4  =     88.331; FM2_A12H_ax_err_4  =    1.38801 # +33 °C 2
FM2_A12H_ex_4  =  0.0778131; FM2_A12H_ex_err_4  = 0.000112099 # +33 °C 2
FM2_A12H_sx_4  =   0.470237; FM2_A12H_sx_err_4  = 0.00931454 # +33 °C 2
FM2_A12H_ba_4  =    4283.01; FM2_A12H_ba_err_4  =     29.149 # +33 °C 2
FM2_A12H_bs_4  =    10.8206; FM2_A12H_bs_err_4  =   0.377435 # +33 °C 2
FM2_A12H_ax_5  =    63.1759; FM2_A12H_ax_err_5  =    1.28118 # +42 °C 2
FM2_A12H_ex_5  =  0.0761494; FM2_A12H_ex_err_5  = 9.6648e−05 # +42 °C 2
FM2_A12H_sx_5  =   0.307747; FM2_A12H_sx_err_5  = 0.00652227 # +42 °C 2
FM2_A12H_ba_5  =     2195.3; FM2_A12H_ba_err_5  =    16.7958 # +42 °C 2
FM2_A12H_bs_5  =    12.3682; FM2_A12H_bs_err_5  =   0.61803 # +42 °C 2
FM2_A12H_ax_6  =    120.993; FM2_A12H_ax_err_6  =    1.80431 # +44 °C 2
FM2_A12H_ex_6  =  0.0776251; FM2_A12H_ex_err_6  = 6.04417e−05 # +44 °C 2
FM2_A12H_sx_6  =   0.268708; FM2_A12H_sx_err_6  = 0.00406809 # +44 °C 2
FM2_A12H_ba_6  =    3783.55; FM2_A12H_ba_err_6  =    22.0961 # +44 °C 2
FM2_A12H_bs_6  =    11.5255; FM2_A12H_bs_err_6  =   0.405014 # +44 °C 2
FM2_A21H_ax_1  =    7.29676; FM2_A21H_ax_err_1  =   0.440937 # −7 °C 3
FM2_A21H_ex_1  =  0.0683138; FM2_A21H_ex_err_1  = 0.000360978 # −7 °C 3
FM2_A21H_sx_1  =   0.392635; FM2_A21H_sx_err_1  =  0.0282097 # −7 °C 3
FM2_A21H_ba_1  =    365.855; FM2_A21H_ba_err_1  =    7.73658 # −7 °C 3
FM2_A21H_bs_1  =    11.0658; FM2_A21H_bs_err_1  =    1.32735 # −7 °C 3
FM2_A21H_ax_2  =     7.9806; FM2_A21H_ax_err_2  =   0.452939 # +7 °C 3
FM2_A21H_ex_2  =  0.0678747; FM2_A21H_ex_err_2  = 0.000317009 # +7 °C 3
FM2_A21H_sx_2  =   0.370952; FM2_A21H_sx_err_2  =  0.0240939 # +7 °C 3
FM2_A21H_ba_2  =    321.393; FM2_A21H_ba_err_2  =    7.29422 # +7 °C 3
FM2_A21H_bs_2  =    12.5038; FM2_A21H_bs_err_2  =    1.79355 # +7 °C 3
FM2_A21H_ax_3  =    9.83458; FM2_A21H_ax_err_3  =   0.520892 # +19 °C 3
FM2_A21H_ex_3  =  0.0695184; FM2_A21H_ex_err_3  = 0.000249708 # +19 °C 3
FM2_A21H_sx_3  =    0.31792; FM2_A21H_sx_err_3  =  0.0179048 # +19 °C 3
FM2_A21H_ba_3  =     335.82; FM2_A21H_ba_err_3  =    6.82317 # +19 °C 3
FM2_A21H_bs_3  =     10.015; FM2_A21H_bs_err_3  =    1.08828 # +19 °C 3
FM2_A21H_ax_4  =      9.937; FM2_A21H_ax_err_4  =   0.535035 # +33 °C 3
FM2_A21H_ex_4  =  0.0698695; FM2_A21H_ex_err_4  = 0.000259035 # +33 °C 3
FM2_A21H_sx_4  =   0.333313; FM2_A21H_sx_err_4  =  0.0195829 # +33 °C 3
FM2_A21H_ba_4  =    378.823; FM2_A21H_ba_err_4  =    7.24515 # +33 °C 3
FM2_A21H_bs_4  =    11.5431; FM2_A21H_bs_err_4  =    1.35176 # +33 °C 3
FM2_A21H_ax_5  =    5.49638; FM2_A21H_ax_err_5  =   0.401709 # +42 °C 3
FM2_A21H_ex_5  =   0.069939; FM2_A21H_ex_err_5  = 0.000321568 # +42 °C 3
FM2_A21H_sx_5  =   0.300332; FM2_A21H_sx_err_5  =  0.0226072 # +42 °C 3
FM2_A21H_ba_5  =    190.996; FM2_A21H_ba_err_5  =    5.06921 # +42 °C 3
FM2_A21H_bs_5  =    10.8024; FM2_A21H_bs_err_5  =    1.66798 # +42 °C 3
FM2_A21H_ax_6  =    10.0279; FM2_A21H_ax_err_6  =   0.517558 # +44 °C 3
FM2_A21H_ex_6  =  0.0704288; FM2_A21H_ex_err_6  = 0.000241564 # +44 °C 3
FM2_A21H_sx_6  =   0.314857; FM2_A21H_sx_err_6  =  0.0170167 # +44 °C 3
FM2_A21H_ba_6  =    325.526; FM2_A21H_ba_err_6  =    6.57088 # +44 °C 3
FM2_A21H_bs_6  =    8.77275; FM2_A21H_bs_err_6  =   0.830893 # +44 °C 3
FM2_A22H_ax_1  =    39.0288; FM2_A22H_ax_err_1  =    1.05879 # −7 °C 4
FM2_A22H_ex_1  =  0.0766842; FM2_A22H_ex_err_1  = 0.000103345 # −7 °C 4
FM2_A22H_sx_1  =    0.25138; FM2_A22H_sx_err_1  = 0.00684444 # −7 °C 4
FM2_A22H_ba_1  =    1243.73; FM2_A22H_ba_err_1  =    12.3785 # −7 °C 4
FM2_A22H_bs_1  =     11.164; FM2_A22H_bs_err_1  =   0.660063 # −7 °C 4
FM2_A22H_ax_2  =    33.7801; FM2_A22H_ax_err_2  =   0.942152 # +7 °C 4
FM2_A22H_ex_2  =  0.0761116; FM2_A22H_ex_err_2  = 0.000127216 # +7 °C 4
FM2_A22H_sx_2  =   0.292783; FM2_A22H_sx_err_2  = 0.00841256 # +7 °C 4
FM2_A22H_ba_2  =    1148.38; FM2_A22H_ba_err_2  =    12.0659 # +7 °C 4
FM2_A22H_bs_2  =    10.3469; FM2_A22H_bs_err_2  =   0.594237 # +7 °C 4
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FM2_A22H_ax_3 =    25.5002; FM2_A22H_ax_err_3 =   0.831515 # +19 °C 4
FM2_A22H_ex_3 = 0.0744715; FM2_A22H_ex_err_3 = 0.000189854 # +19 °C 4
FM2_A22H_sx_3 =  0.381572; FM2_A22H_sx_err_3 =   0.014193 # +19 °C 4
FM2_A22H_ba_3 =   1264.91; FM2_A22H_ba_err_3 =    13.1107 # +19 °C 4
FM2_A22H_bs_3 =   11.1269; FM2_A22H_bs_err_3 =   0.672066 # +19 °C 4
FM2_A22H_ax_4 =   24.8058; FM2_A22H_ax_err_4 =   0.671729 # +33 °C 4
FM2_A22H_ex_4 = 0.0766577; FM2_A22H_ex_err_4 = 0.000234262 # +33 °C 4
FM2_A22H_sx_4 =  0.546021; FM2_A22H_sx_err_4 =   0.020076 # +33 °C 4
FM2_A22H_ba_4 =   1369.18; FM2_A22H_ba_err_4 =    17.8057 # +33 °C 4
FM2_A22H_bs_4 =   10.5264; FM2_A22H_bs_err_4 =   0.657916 # +33 °C 4
FM2_A22H_ax_5 =   17.0797; FM2_A22H_ax_err_5 =   0.669568 # +42 °C 4
FM2_A22H_ex_5 = 0.0758427; FM2_A22H_ex_err_5 = 0.000207029 # +42 °C 4
FM2_A22H_sx_5 =  0.343789; FM2_A22H_sx_err_5 =  0.0146028 # +42 °C 4
FM2_A22H_ba_5 =   685.652; FM2_A22H_ba_err_5 =    9.56959 # +42 °C 4
FM2_A22H_bs_5 =   10.3075; FM2_A22H_bs_err_5 =   0.777588 # +42 °C 4
FM2_A22H_ax_6 =   32.2778; FM2_A22H_ax_err_6 =   0.906303 # +44 °C 4
FM2_A22H_ex_6 = 0.0767905; FM2_A22H_ex_err_6 = 0.000147281 # +44 °C 4
FM2_A22H_sx_6 =  0.341084; FM2_A22H_sx_err_6 =  0.0103455 # +44 °C 4
FM2_A22H_ba_6 =    1221.4; FM2_A22H_ba_err_6 =    12.9158 # +44 °C 4
FM2_A22H_bs_6 =   12.1818; FM2_A22H_bs_err_6 =   0.813272 # +44 °C 4
FM2_B11H_ax_1 =   45.2271; FM2_B11H_ax_err_1 =   0.986395 # −7 °C 5
FM2_B11H_ex_1 = 0.0792716; FM2_B11H_ex_err_1 = 0.000117021 # −7 °C 5
FM2_B11H_sx_1 =  0.355784; FM2_B11H_sx_err_1 =  0.0082704 # −7 °C 5
FM2_B11H_ba_1 =   1218.16; FM2_B11H_ba_err_1 =    14.1258 # −7 °C 5
FM2_B11H_bs_1 =   16.3813; FM2_B11H_bs_err_1 =    1.56238 # −7 °C 5
FM2_B11H_ax_2 =   33.1187; FM2_B11H_ax_err_2 =   0.796082 # +7 °C 5
FM2_B11H_ex_2 = 0.0779192; FM2_B11H_ex_err_2 = 0.00016689 # +7 °C 5
FM2_B11H_sx_2 =  0.456046; FM2_B11H_sx_err_2 =  0.0132894 # +7 °C 5
FM2_B11H_ba_2 =   1173.54; FM2_B11H_ba_err_2 =    14.7516 # +7 °C 5
FM2_B11H_bs_2 =   17.0095; FM2_B11H_bs_err_2 =    1.77676 # +7 °C 5
FM2_B11H_ax_3 =   49.4539; FM2_B11H_ax_err_3 =    1.05583 # +19 °C 5
FM2_B11H_ex_3 = 0.0780785; FM2_B11H_ex_err_3 = 9.91026e−05 # +19 °C 5
FM2_B11H_sx_3 =  0.306032; FM2_B11H_sx_err_3 = 0.00658533 # +19 °C 5
FM2_B11H_ba_3 =    1209.3; FM2_B11H_ba_err_3 =    12.9127 # +19 °C 5
FM2_B11H_bs_3 =   24.8846; FM2_B11H_bs_err_3 =    3.46369 # +19 °C 5
FM2_B11H_ax_4 =   49.1339; FM2_B11H_ax_err_4 =   0.982245 # +33 °C 5
FM2_B11H_ex_4 = 0.0810886; FM2_B11H_ex_err_4 = 0.000118677 # +33 °C 5
FM2_B11H_sx_4 =  0.395588; FM2_B11H_sx_err_4 = 0.00892445 # +33 °C 5
FM2_B11H_ba_4 =    1279.7; FM2_B11H_ba_err_4 =    16.8135 # +33 °C 5
FM2_B11H_bs_4 =   11.9883; FM2_B11H_bs_err_4 =   0.888281 # +33 °C 5
FM2_B11H_ax_5 =   22.6896; FM2_B11H_ax_err_5 =    0.66773 # +42 °C 5
FM2_B11H_ex_5 = 0.0812926; FM2_B11H_ex_err_5 = 0.000186636 # +42 °C 5
FM2_B11H_sx_5 =  0.418251; FM2_B11H_sx_err_5 =  0.0143912 # +42 °C 5
FM2_B11H_ba_5 =   664.186; FM2_B11H_ba_err_5 =    12.9141 # +42 °C 5
FM2_B11H_bs_5 =   10.3814; FM2_B11H_bs_err_5 =     0.9656 # +42 °C 5
FM2_B11H_ax_6 =   35.1881; FM2_B11H_ax_err_6 =   0.778054 # +44 °C 5
FM2_B11H_ex_6 = 0.0802057; FM2_B11H_ex_err_6 = 0.000165909 # +44 °C 5
FM2_B11H_sx_6 =  0.488159; FM2_B11H_sx_err_6 =  0.0137254 # +44 °C 5
FM2_B11H_ba_6 =   1162.51; FM2_B11H_ba_err_6 =    17.8395 # +44 °C 5
FM2_B11H_bs_6 =   12.0677; FM2_B11H_bs_err_6 =    1.01445 # +44 °C 5
FM2_B12H_ax_1 =   175.378; FM2_B12H_ax_err_1 =    1.99325 # −7 °C 6
FM2_B12H_ex_1 = 0.0720687; FM2_B12H_ex_err_1 = 5.77242e−05 # −7 °C 6
FM2_B12H_sx_1 =  0.341559; FM2_B12H_sx_err_1 = 0.00408951 # −7 °C 6
FM2_B12H_ba_1 =   4582.08; FM2_B12H_ba_err_1 =    25.1272 # −7 °C 6
FM2_B12H_bs_1 =   14.9773; FM2_B12H_bs_err_1 =   0.660324 # −7 °C 6
FM2_B12H_ax_2 =   154.206; FM2_B12H_ax_err_2 =    1.84229 # +7 °C 6
FM2_B12H_ex_2 = 0.0729792; FM2_B12H_ex_err_2 = 6.4151e−05 # +7 °C 6
FM2_B12H_sx_2 =  0.358648; FM2_B12H_sx_err_2 = 0.00461152 # +7 °C 6
FM2_B12H_ba_2 =   4266.46; FM2_B12H_ba_err_2 =    24.1749 # +7 °C 6
FM2_B12H_bs_2 =   14.2059; FM2_B12H_bs_err_2 =   0.609511 # +7 °C 6
FM2_B12H_ax_3 =   166.519; FM2_B12H_ax_err_3 =    1.90605 # +19 °C 6
FM2_B12H_ex_3 = 0.0738773; FM2_B12H_ex_err_3 = 6.07862e−05 # +19 °C 6
FM2_B12H_sx_3 =  0.352094; FM2_B12H_sx_err_3 = 0.00428788 # +19 °C 6
FM2_B12H_ba_3 =   4428.17; FM2_B12H_ba_err_3 =    24.4834 # +19 °C 6
FM2_B12H_bs_3 =   14.3435; FM2_B12H_bs_err_3 =   0.607228 # +19 °C 6
FM2_B12H_ax_4 =   201.675; FM2_B12H_ax_err_4 =    2.12367 # +33 °C 6
FM2_B12H_ex_4 = 0.0749029; FM2_B12H_ex_err_4 = 5.18453e−05 # +33 °C 6
FM2_B12H_sx_4 =  0.323605; FM2_B12H_sx_err_4 = 0.00349221 # +33 °C 6
FM2_B12H_ba_4 =   5015.05; FM2_B12H_ba_err_4 =    25.7555 # +33 °C 6
FM2_B12H_bs_4 =   13.5396; FM2_B12H_bs_err_4 =   0.504508 # +33 °C 6
FM2_B12H_ax_5 =   102.865; FM2_B12H_ax_err_5 =    1.50916 # +42 °C 6
FM2_B12H_ex_5 = 0.0752466; FM2_B12H_ex_err_5 = 7.22664e−05 # +42 °C 6
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797  FM2_B12H_sx_5  =     0.32371; FM2_B12H_sx_err_5  = 0.00488098 # +42 °C 6
798  FM2_B12H_ba_5  =     2535.44; FM2_B12H_ba_err_5  =     18.3306 # +42 °C 6
799  FM2_B12H_bs_5  =     13.4823; FM2_B12H_bs_err_5  =    0.702117 # +42 °C 6
800  FM2_B12H_ax_6  =     174.443; FM2_B12H_ax_err_6  =     1.97674 # +44 °C 6
801  FM2_B12H_ex_6  =    0.075355; FM2_B12H_ex_err_6  = 5.65288e-05 # +44 °C 6
802  FM2_B12H_sx_6  =    0.328688; FM2_B12H_sx_err_6  = 0.00385021 # +44 °C 6
803  FM2_B12H_ba_6  =     4452.03; FM2_B12H_ba_err_6  =     24.3882 # +44 °C 6
804  FM2_B12H_bs_6  =     13.6543; FM2_B12H_bs_err_6  =    0.544686 # +44 °C 6
805  FM2_A11H_ac_1  =     52.0819; FM2_A11H_ac_err_1  =      9.7488 # -7 °C 1
806  FM2_A11H_ec_1  =   0.0750122; FM2_A11H_ec_err_1  = 0.000650506 # -7 °C 1
807  FM2_A11H_sc_1  =    0.941471; FM2_A11H_sc_err_1  =     0.52482 # -7 °C 1
808  FM2_A11H_bca_1 =     188.346; FM2_A11H_bca_err_1 =     5.85237 # -7 °C 1
809  FM2_A11H_bcs_1 =     11.9618; FM2_A11H_bcs_err_1 =     0.64655 # -7 °C 1
810  FM2_A11H_ac_2  =     55.0529; FM2_A11H_ac_err_2  =     8.76547 # +7 °C 1
811  FM2_A11H_ec_2  =   0.0763605; FM2_A11H_ec_err_2  = 0.000578043 # +7 °C 1
812  FM2_A11H_sc_2  =    0.906222; FM2_A11H_sc_err_2  =    0.464958 # +7 °C 1
813  FM2_A11H_bca_2 =     171.408; FM2_A11H_bca_err_2 =     4.87008 # +7 °C 1
814  FM2_A11H_bcs_2 =     13.2158; FM2_A11H_bcs_err_2 =    0.749742 # +7 °C 1
815  FM2_A11H_ac_3  =     92.0115; FM2_A11H_ac_err_3  =     14.4102 # +19 °C 1
816  FM2_A11H_ec_3  =   0.0756369; FM2_A11H_ec_err_3  = 0.000654682 # +19 °C 1
817  FM2_A11H_sc_3  =     1.91355; FM2_A11H_sc_err_3  =    0.531689 # +19 °C 1
818  FM2_A11H_bca_3 =     190.592; FM2_A11H_bca_err_3 =     6.33842 # +19 °C 1
819  FM2_A11H_bcs_3 =     14.9207; FM2_A11H_bcs_err_3 =     1.25401 # +19 °C 1
820  FM2_A11H_ac_4  =     91.3463; FM2_A11H_ac_err_4  =     12.3294 # +33 °C 1
821  FM2_A11H_ec_4  =   0.0768103; FM2_A11H_ec_err_4  = 0.000579865 # +33 °C 1
822  FM2_A11H_sc_4  =     1.60182; FM2_A11H_sc_err_4  =    0.464533 # +33 °C 1
823  FM2_A11H_bca_4 =     203.191; FM2_A11H_bca_err_4 =      6.1197 # +33 °C 1
824  FM2_A11H_bcs_4 =     14.2352; FM2_A11H_bcs_err_4 =    0.916062 # +33 °C 1
825  FM2_A11H_ac_5  =     79.5237; FM2_A11H_ac_err_5  =     68.9163 # +42 °C 1
826  FM2_A11H_ec_5  =   0.0755334; FM2_A11H_ec_err_5  = 0.00312893 # +42 °C 1
827  FM2_A11H_sc_5  =     4.90269; FM2_A11H_sc_err_5  =      3.0378 # +42 °C 1
828  FM2_A11H_bca_5 =     112.984; FM2_A11H_bca_err_5 =     16.8463 # +42 °C 1
829  FM2_A11H_bcs_5 =     19.3999; FM2_A11H_bcs_err_5 =      11.223 # +42 °C 1
830  FM2_A11H_ac_6  =     243.825; FM2_A11H_ac_err_6  =     373.961 # +44 °C 1
831  FM2_A11H_ec_6  =   0.0743322; FM2_A11H_ec_err_6  =   0.0104948 # +44 °C 1
832  FM2_A11H_sc_6  =     7.09217; FM2_A11H_sc_err_6  =     5.22681 # +44 °C 1
833  FM2_A11H_bca_6 =     200.999; FM2_A11H_bca_err_6 =     111.276 # +44 °C 1
834  FM2_A11H_bcs_6 =     25.4398; FM2_A11H_bcs_err_6 =     45.4953 # +44 °C 1
835  FM2_A12H_ac_1  =     315.304; FM2_A12H_ac_err_1  =     34.4852 # -7 °C 2
836  FM2_A12H_ec_1  =   0.0749791; FM2_A12H_ec_err_1  = 0.000428644 # -7 °C 2
837  FM2_A12H_sc_1  =     2.24393; FM2_A12H_sc_err_1  =    0.367752 # -7 °C 2
838  FM2_A12H_bca_1 =     732.305; FM2_A12H_bca_err_1 =     15.2007 # -7 °C 2
839  FM2_A12H_bcs_1 =     13.8922; FM2_A12H_bcs_err_1 =    0.666153 # -7 °C 2
840  FM2_A12H_ac_2  =      287.88; FM2_A12H_ac_err_2  =     27.9411 # +7 °C 2
841  FM2_A12H_ec_2  =   0.0771945; FM2_A12H_ec_err_2  = 0.000447641 # +7 °C 2
842  FM2_A12H_sc_2  =     2.22678; FM2_A12H_sc_err_2  =    0.365143 # +7 °C 2
843  FM2_A12H_bca_2 =     628.054; FM2_A12H_bca_err_2 =     14.4068 # +7 °C 2
844  FM2_A12H_bcs_2 =      13.585; FM2_A12H_bcs_err_2 =    0.544335 # +7 °C 2
845  FM2_A12H_ac_3  =     284.486; FM2_A12H_ac_err_3  =     25.9129 # +19 °C 2
846  FM2_A12H_ec_3  =   0.0771434; FM2_A12H_ec_err_3  = 0.000412796 # +19 °C 2
847  FM2_A12H_sc_3  =     1.97832; FM2_A12H_sc_err_3  =     0.33721 # +19 °C 2
848  FM2_A12H_bca_3 =     682.685; FM2_A12H_bca_err_3 =     14.1299 # +19 °C 2
849  FM2_A12H_bcs_3 =     13.3623; FM2_A12H_bcs_err_3 =    0.470028 # +19 °C 2
850  FM2_A12H_ac_4  =     330.493; FM2_A12H_ac_err_4  =     29.7246 # +33 °C 2
851  FM2_A12H_ec_4  =   0.0769027; FM2_A12H_ec_err_4  = 0.000403543 # +33 °C 2
852  FM2_A12H_sc_4  =     2.08838; FM2_A12H_sc_err_4  =    0.329819 # +33 °C 2
853  FM2_A12H_bca_4 =     785.377; FM2_A12H_bca_err_4 =     15.6112 # +33 °C 2
854  FM2_A12H_bcs_4 =     13.6798; FM2_A12H_bcs_err_4 =    0.489966 # +33 °C 2
855  FM2_A12H_ac_5  =     174.658; FM2_A12H_ac_err_5  =     17.0418 # +42 °C 2
856  FM2_A12H_ec_5  =   0.0763238; FM2_A12H_ec_err_5  = 0.00040752 # +42 °C 2
857  FM2_A12H_sc_5  =     1.51921; FM2_A12H_sc_err_5  =    0.327311 # +42 °C 2
858  FM2_A12H_bca_5 =     403.198; FM2_A12H_bca_err_5 =     8.36104 # +42 °C 2
859  FM2_A12H_bcs_5 =     14.3145; FM2_A12H_bcs_err_5 =    0.666891 # +42 °C 2
860  FM2_A12H_ac_6  =     253.406; FM2_A12H_ac_err_6  =     19.3145 # +44 °C 2
861  FM2_A12H_ec_6  =   0.0764635; FM2_A12H_ec_err_6  = 0.000295668 # +44 °C 2
862  FM2_A12H_sc_6  =     1.13763; FM2_A12H_sc_err_6  =    0.241008 # +44 °C 2
863  FM2_A12H_bca_6 =     707.349; FM2_A12H_bca_err_6 =     10.4307 # +44 °C 2
864  FM2_A12H_bcs_6 =     13.4155; FM2_A12H_bcs_err_6 =    0.397698 # +44 °C 2
865  FM2_A21H_ac_1  =     14.0411; FM2_A21H_ac_err_1  =     3.85178 # -7 °C 3
866  FM2_A21H_ec_1  =   0.0685016; FM2_A21H_ec_err_1  = 0.000574116 # -7 °C 3
867  FM2_A21H_sc_1  =    0.363696; FM2_A21H_sc_err_1  =    0.482009 # -7 °C 3
868  FM2_A21H_bca_1 =     32.0622; FM2_A21H_bca_err_1 =     1.47144 # -7 °C 3
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FM2_A21H_bcs_1 =     8.32985; FM2_A21H_bcs_err_1 =    0.916879 # -7 °C 3
FM2_A21H_ac_2  =     29.3161; FM2_A21H_ac_err_2  =     5.27849 # +7 °C 3
FM2_A21H_ec_2  =    0.070795; FM2_A21H_ec_err_2  = 0.000592693 # +7 °C 3
FM2_A21H_sc_2  =     1.20112; FM2_A21H_sc_err_2  =    0.456058 # +7 °C 3
FM2_A21H_bca_2 =     29.3242; FM2_A21H_bca_err_2 =     1.77735 # +7 °C 3
FM2_A21H_bcs_2 =     16.2325; FM2_A21H_bcs_err_2 =     4.30883 # +7 °C 3
FM2_A21H_ac_3  =     10.7586; FM2_A21H_ac_err_3  =     42.8263 # +19 °C 3
FM2_A21H_ec_3  =   0.0745768; FM2_A21H_ec_err_3  =   0.0753102 # +19 °C 3
FM2_A21H_sc_3  =    0.086877; FM2_A21H_sc_err_3  =     47.5014 # +19 °C 3
FM2_A21H_bca_3 =     21.6334; FM2_A21H_bca_err_3 =      85.025 # +19 °C 3
FM2_A21H_bcs_3 =      7.5681; FM2_A21H_bcs_err_3 =    0.559871 # +19 °C 3
FM2_A21H_ac_4  =     51.0893; FM2_A21H_ac_err_4  =     3.76662 # +33 °C 3
FM2_A21H_ec_4  =   0.0715456; FM2_A21H_ec_err_4  =     0.12274 # +33 °C 3
FM2_A21H_sc_4  =   0.0868773; FM2_A21H_sc_err_4  =     138.316 # +33 °C 3
FM2_A21H_bca_4 =     38.9994; FM2_A21H_bca_err_4 =     1.38873 # +33 °C 3
FM2_A21H_bcs_4 = -4.0319e+07; FM2_A21H_bcs_err_4 = 1.80007e+13 # +33 °C 3
FM2_A21H_ac_5  =     8.93178; FM2_A21H_ac_err_5  =     2.58478 # +42 °C 3
FM2_A21H_ec_5  =   0.0711837; FM2_A21H_ec_err_5  = 0.000733963 # +42 °C 3
FM2_A21H_sc_5  =     0.47933; FM2_A21H_sc_err_5  =    0.585437 # +42 °C 3
FM2_A21H_bca_5 =      14.549; FM2_A21H_bca_err_5 =    0.978332 # +42 °C 3
FM2_A21H_bcs_5 =     9.80758; FM2_A21H_bcs_err_5 =     1.65756 # +42 °C 3
FM2_A21H_ac_6  =     12.5928; FM2_A21H_ac_err_6  =     3.07512 # +44 °C 3
FM2_A21H_ec_6  =   0.0711831; FM2_A21H_ec_err_6  = 0.000694391 # +44 °C 3
FM2_A21H_sc_6  =    0.130435; FM2_A21H_sc_err_6  =    0.248727 # +44 °C 3
FM2_A21H_bca_6 =     27.2722; FM2_A21H_bca_err_6 =     1.45387 # +44 °C 3
FM2_A21H_bcs_6 =     8.05943; FM2_A21H_bcs_err_6 =    0.74473 # +44 °C 3
FM2_A22H_ac_1  =     48.5621; FM2_A22H_ac_err_1  =     170.832 # -7 °C 4
FM2_A22H_ec_1  =   0.0747137; FM2_A22H_ec_err_1  =   0.0797501 # -7 °C 4
FM2_A22H_sc_1  =   0.0940864; FM2_A22H_sc_err_1  =     199.212 # -7 °C 4
FM2_A22H_bca_1 =     107.045; FM2_A22H_bca_err_1 =     373.404 # -7 °C 4
FM2_A22H_bcs_1 =     9.01578; FM2_A22H_bcs_err_1 =    0.379086 # -7 °C 4
FM2_A22H_ac_2  =     84.9194; FM2_A22H_ac_err_2  =      13.525 # +7 °C 4
FM2_A22H_ec_2  =   0.0754154; FM2_A22H_ec_err_2  = 0.000717051 # +7 °C 4
FM2_A22H_sc_2  =     2.45905; FM2_A22H_sc_err_2  =     0.55874 # +7 °C 4
FM2_A22H_bca_2 =     102.868; FM2_A22H_bca_err_2 =     5.39169 # +7 °C 4
FM2_A22H_bcs_2 =     12.8628; FM2_A22H_bcs_err_2 =     1.41007 # +7 °C 4
FM2_A22H_ac_3  =     86.5207; FM2_A22H_ac_err_3  =     8.43646 # +19 °C 4
FM2_A22H_ec_3  =   0.0757001; FM2_A22H_ec_err_3  = 0.000408143 # +19 °C 4
FM2_A22H_sc_3  =     1.39088; FM2_A22H_sc_err_3  =    0.315516 # +19 °C 4
FM2_A22H_bca_3 =     110.202; FM2_A22H_bca_err_3 =     3.68576 # +19 °C 4
FM2_A22H_bcs_3 =      12.077; FM2_A22H_bcs_err_3 =    0.830633 # +19 °C 4
FM2_A22H_ac_4  =     74.4196; FM2_A22H_ac_err_4  =     7.53023 # +33 °C 4
FM2_A22H_ec_4  =   0.0769284; FM2_A22H_ec_err_4  = 0.00042206 # +33 °C 4
FM2_A22H_sc_4  =     1.14167; FM2_A22H_sc_err_4  =    0.327548 # +33 °C 4
FM2_A22H_bca_4 =     118.572; FM2_A22H_bca_err_4 =     3.80656 # +33 °C 4
FM2_A22H_bcs_4 =     10.8799; FM2_A22H_bcs_err_4 =    0.554085 # +33 °C 4
FM2_A22H_ac_5  =     37.6699; FM2_A22H_ac_err_5  =     8.10126 # +42 °C 4
FM2_A22H_ec_5  =   0.0765323; FM2_A22H_ec_err_5  = 0.00099531 # +42 °C 4
FM2_A22H_sc_5  =     2.10848; FM2_A22H_sc_err_5  =    0.783554 # +42 °C 4
FM2_A22H_bca_5 =     58.8259; FM2_A22H_bca_err_5 =     4.01817 # +42 °C 4
FM2_A22H_bcs_5 =     10.9209; FM2_A22H_bcs_err_5 =     1.07985 # +42 °C 4
FM2_A22H_ac_6  =     62.4658; FM2_A22H_ac_err_6  =     6.37419 # +44 °C 4
FM2_A22H_ec_6  =   0.0763193; FM2_A22H_ec_err_6  = 0.000368545 # +44 °C 4
FM2_A22H_sc_6  =    0.804768; FM2_A22H_sc_err_6  =    0.294136 # +44 °C 4
FM2_A22H_bca_6 =      104.02; FM2_A22H_bca_err_6 =     3.11327 # +44 °C 4
FM2_A22H_bcs_6 =     10.3905; FM2_A22H_bcs_err_6 =    0.521738 # +44 °C 4
FM2_B11H_ac_1  =     110.526; FM2_B11H_ac_err_1  =     11.0339 # -7 °C 5
FM2_B11H_ec_1  =    0.076875; FM2_B11H_ec_err_1  = 0.000373583 # -7 °C 5
FM2_B11H_sc_1  =    0.964378; FM2_B11H_sc_err_1  =    0.297873 # -7 °C 5
FM2_B11H_bca_1 =     265.642; FM2_B11H_bca_err_1 =     5.17397 # -7 °C 5
FM2_B11H_bcs_1 =     16.0024; FM2_B11H_bcs_err_1 =    0.876148 # -7 °C 5
FM2_B11H_ac_2  =     89.8672; FM2_B11H_ac_err_2  =     682.048 # +7 °C 5
FM2_B11H_ec_2  =   0.0779625; FM2_B11H_ec_err_2  =     0.30581 # +7 °C 5
FM2_B11H_sc_2  =   0.0825467; FM2_B11H_sc_err_2  =     237.105 # +7 °C 5
FM2_B11H_bca_2 =     238.858; FM2_B11H_bca_err_2 =     1817.69 # +7 °C 5
FM2_B11H_bcs_2 =     15.8246; FM2_B11H_bcs_err_2 =    0.712219 # +7 °C 5
FM2_B11H_ac_3  =     114.351; FM2_B11H_ac_err_3  =     11.9868 # +19 °C 5
FM2_B11H_ec_3  =     0.07853; FM2_B11H_ec_err_3  = 0.000468117 # +19 °C 5
FM2_B11H_sc_3  =     1.42283; FM2_B11H_sc_err_3  =     0.36843 # +19 °C 5
FM2_B11H_bca_3 =     242.933; FM2_B11H_bca_err_3 =     5.95918 # +19 °C 5
FM2_B11H_bcs_3 =     16.5241; FM2_B11H_bcs_err_3 =    0.967074 # +19 °C 5
FM2_B11H_ac_4  =     137.138; FM2_B11H_ac_err_4  =     11.5056 # +33 °C 5
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941  FM2_B11H_ec_4  =  0.0783195; FM2_B11H_ec_err_4  = 0.000337614 # +33 °C 5
942  FM2_B11H_sc_4  =    1.04495; FM2_B11H_sc_err_4  =    0.264897 # +33 °C 5
943  FM2_B11H_bca_4 =    289.069; FM2_B11H_bca_err_4 =     5.27936 # +33 °C 5
944  FM2_B11H_bcs_4 =     18.938; FM2_B11H_bcs_err_4 =     1.10859 # +33 °C 5
945  FM2_B11H_ac_5  =    58.8732; FM2_B11H_ac_err_5  =     8.59311 # +42 °C 5
946  FM2_B11H_ec_5  =  0.0788337; FM2_B11H_ec_err_5  = 0.000636579 # +42 °C 5
947  FM2_B11H_sc_5  =    1.26983; FM2_B11H_sc_err_5  =    0.497853 # +42 °C 5
948  FM2_B11H_bca_5 =    140.326; FM2_B11H_bca_err_5 =     4.47393 # +42 °C 5
949  FM2_B11H_bcs_5 =    16.6468; FM2_B11H_bcs_err_5 =     1.23853 # +42 °C 5
950  FM2_B11H_ac_6  =     103.78; FM2_B11H_ac_err_6  =     11.4352 # +44 °C 5
951  FM2_B11H_ec_6  =  0.0791631; FM2_B11H_ec_err_6  = 0.000509468 # +44 °C 5
952  FM2_B11H_sc_6  =    1.44515; FM2_B11H_sc_err_6  =    0.393623 # +44 °C 5
953  FM2_B11H_bca_6 =    222.846; FM2_B11H_bca_err_6 =     6.13811 # +44 °C 5
954  FM2_B11H_bcs_6 =    15.2976; FM2_B11H_bcs_err_6 =    0.821809 # +44 °C 5
955  FM2_B12H_ac_1  =    484.477; FM2_B12H_ac_err_1  =     31.2443 # −7 °C 6
956  FM2_B12H_ec_1  =    0.07529; FM2_B12H_ec_err_1  = 0.000254411 # −7 °C 6
957  FM2_B12H_sc_1  =    1.71585; FM2_B12H_sc_err_1  =    0.212254 # −7 °C 6
958  FM2_B12H_bca_1 =     1010.8; FM2_B12H_bca_err_1 =     12.7478 # −7 °C 6
959  FM2_B12H_bcs_1 =    16.4952; FM2_B12H_bcs_err_1 =    0.662546 # −7 °C 6
960  FM2_B12H_ac_2  =    416.435; FM2_B12H_ac_err_2  =     22.2923 # +7 °C 6
961  FM2_B12H_ec_2  =  0.0753017; FM2_B12H_ec_err_2  = 0.000187561 # +7 °C 6
962  FM2_B12H_sc_2  =   0.970294; FM2_B12H_sc_err_2  =    0.152893 # +7 °C 6
963  FM2_B12H_bca_2 =    957.162; FM2_B12H_bca_err_2 =     9.31487 # +7 °C 6
964  FM2_B12H_bcs_2 =    16.6339; FM2_B12H_bcs_err_2 =    0.560307 # +7 °C 6
965  FM2_B12H_ac_3  =     444.07; FM2_B12H_ac_err_3  =     22.2642 # +19 °C 6
966  FM2_B12H_ec_3  =  0.0759175; FM2_B12H_ec_err_3  = 0.000179191 # +19 °C 6
967  FM2_B12H_sc_3  =   0.971104; FM2_B12H_sc_err_3  =    0.145757 # +19 °C 6
968  FM2_B12H_bca_3 =    992.032; FM2_B12H_bca_err_3 =     9.40966 # +19 °C 6
969  FM2_B12H_bcs_3 =    17.1042; FM2_B12H_bcs_err_3 =     0.56026 # +19 °C 6
970  FM2_B12H_ac_4  =     482.95; FM2_B12H_ac_err_4  =     25.9534 # +33 °C 6
971  FM2_B12H_ec_4  =  0.0764905; FM2_B12H_ec_err_4  = 0.000214709 # +33 °C 6
972  FM2_B12H_sc_4  =    1.31672; FM2_B12H_sc_err_4  =    0.173907 # +33 °C 6
973  FM2_B12H_bca_4 =    1084.78; FM2_B12H_bca_err_4 =     11.6653 # +33 °C 6
974  FM2_B12H_bcs_4 =    16.6047; FM2_B12H_bcs_err_4 =    0.527677 # +33 °C 6
975  FM2_B12H_ac_5  =     252.72; FM2_B12H_ac_err_5  =     18.9655 # +42 °C 6
976  FM2_B12H_ec_5  =  0.0775236; FM2_B12H_ec_err_5  = 0.000330222 # +42 °C 6
977  FM2_B12H_sc_5  =    1.56156; FM2_B12H_sc_err_5  =    0.263174 # +42 °C 6
978  FM2_B12H_bca_5 =    520.326; FM2_B12H_bca_err_5 =     9.00904 # +42 °C 6
979  FM2_B12H_bcs_5 =    15.9747; FM2_B12H_bcs_err_5 =    0.68284 # +42 °C 6
980  FM2_B12H_ac_6  =    394.937; FM2_B12H_ac_err_6  =     21.4375 # +44 °C 6
981  FM2_B12H_ec_6  =  0.0760773; FM2_B12H_ec_err_6  = 0.000195177 # +44 °C 6
982  FM2_B12H_sc_6  =   0.956333; FM2_B12H_sc_err_6  =    0.158839 # +44 °C 6
983  FM2_B12H_bca_6 =    950.592; FM2_B12H_bca_err_6 =     9.61073 # +44 °C 6
984  FM2_B12H_bcs_6 =    15.9763; FM2_B12H_bcs_err_6 =    0.489216 # +44 °C 6
985  FM2_A11H_ee0 =  0.0758786; FM2_A11H_ee0_err = 0.000107048
986  FM2_A11H_ee1 =   0.105882; FM2_A11H_ee1_err =   0.017596
987  FM2_A11H_ee2 =   −27.9487; FM2_A11H_ee2_err =    3.80354
988  FM2_A12H_ee0 =  0.0769791; FM2_A12H_ee0_err = 4.98435e−05
989  FM2_A12H_ee1 = −0.00436339; FM2_A12H_ee1_err = 0.00707124
990  FM2_A12H_ee2 =    3.03828; FM2_A12H_ee2_err =    1.87146
991  FM2_A21H_ee0 =  0.0685302; FM2_A21H_ee0_err = 0.000191347
992  FM2_A21H_ee1 =  0.0556645; FM2_A21H_ee1_err =  0.0271201
993  FM2_A21H_ee2 =    1.61349; FM2_A21H_ee2_err =    6.19739
994  FM2_A22H_ee0 =  0.0761686; FM2_A22H_ee0_err = 7.6011e−05
995  FM2_A22H_ee1 = −0.0898424; FM2_A22H_ee1_err =  0.0113142
996  FM2_A22H_ee2 =    23.4488; FM2_A22H_ee2_err =    2.90609
997  FM2_B11H_ee0 =  0.0784748; FM2_B11H_ee0_err = 7.79219e−05
998  FM2_B11H_ee1 =  −0.051208; FM2_B11H_ee1_err = 0.00928909
999  FM2_B11H_ee2 =    29.7814; FM2_B11H_ee2_err =    2.43345
1000 FM2_B12H_ee0 =  0.0727615; FM2_B12H_ee0_err = 3.7396e−05
1001 FM2_B12H_ee1 =   0.10714; FM2_B12H_ee1_err = 0.00508427
1002 FM2_B12H_ee2 =   −5.26263; FM2_B12H_ee2_err =    1.23795
1003 FM2_HET_e0 =    1.00201; FM2_HET_e0_err = 2.37755e−05
1004 FM2_HET_e1 =  0.0602103; FM2_HET_e1_err = 0.000244251
1005 FM2_HET_e2 =   −3.98145; FM2_HET_e2_err =  0.0611746
1006 FM2_B13G_ax_1  =     500.956; FM2_B13G_ax_err_1  =     2.72167 # −7 °C
1007 FM2_B13G_ex_1  =  0.0905113; FM2_B13G_ex_err_1  = 5.46236e−05 # −7 °C
1008 FM2_B13G_sx_1  =   0.674118; FM2_B13G_sx_err_1  = 0.00591805 # −7 °C
1009 FM2_B13G_ba_1  =     19283.2; FM2_B13G_ba_err_1  =     143.612 # −7 °C
1010 FM2_B13G_bs_1  =     44.6543; FM2_B13G_bs_err_1  =     3.94343 # −7 °C
1011 FM2_B13G_ax_2  =     453.933; FM2_B13G_ax_err_2  =     2.64129 # +7 °C
1012 FM2_B13G_ex_2  =  0.0908819; FM2_B13G_ex_err_2  = 6.17368e−05 # +7 °C
1013 FM2_B13G_sx_2  =   0.706862; FM2_B13G_sx_err_2  = 0.00678402 # +7 °C
1014 FM2_B13G_ba_2  =     19028.3; FM2_B13G_ba_err_2  =     151.785 # +7 °C
1015 FM2_B13G_bs_2  =     37.6794; FM2_B13G_bs_err_2  =     2.99488 # +7 °C
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1016  FM2_B13G_ax_3  =    462.054; FM2_B13G_ax_err_3  =    2.82858 # +19 °C
1017  FM2_B13G_ex_3  =  0.0907673; FM2_B13G_ex_err_3  = 6.7045e-05 # +19 °C
1018  FM2_B13G_sx_3  =   0.763166; FM2_B13G_sx_err_3  =  0.0076766 # +19 °C
1019  FM2_B13G_ba_3  =    20641.7; FM2_B13G_ba_err_3  =    185.492 # +19 °C
1020  FM2_B13G_bs_3  =    39.7709; FM2_B13G_bs_err_3  =    3.68179 # +19 °C
1021  FM2_B13G_ax_4  =    514.771; FM2_B13G_ax_err_4  =    3.07344 # +33 °C
1022  FM2_B13G_ex_4  =  0.0909909; FM2_B13G_ex_err_4  = 6.64002e-05 # +33 °C
1023  FM2_B13G_sx_4  =   0.781588; FM2_B13G_sx_err_4  = 0.00763345 # +33 °C
1024  FM2_B13G_ba_4  =    24082.9; FM2_B13G_ba_err_4  =    207.281 # +33 °C
1025  FM2_B13G_bs_4  =    38.9649; FM2_B13G_bs_err_4  =    3.37634 # +33 °C
1026  FM2_B13G_ax_5  =    262.112; FM2_B13G_ax_err_5  =    2.27208 # +42 °C
1027  FM2_B13G_ex_5  =  0.0910643; FM2_B13G_ex_err_5  = 9.71935e-05 # +42 °C
1028  FM2_B13G_sx_5  =   0.805547; FM2_B13G_sx_err_5  =  0.0112601 # +42 °C
1029  FM2_B13G_ba_5  =    12494.7; FM2_B13G_ba_err_5  =    158.076 # +42 °C
1030  FM2_B13G_bs_5  =    37.5537; FM2_B13G_bs_err_5  =    4.57904 # +42 °C
1031  FM2_B13G_ax_6  =     453.36; FM2_B13G_ax_err_6  =    3.08948 # +44 °C
1032  FM2_B13G_ex_6  =  0.0909967; FM2_B13G_ex_err_6  = 7.57316e-05 # +44 °C
1033  FM2_B13G_sx_6  =   0.823917; FM2_B13G_sx_err_6  = 0.00886338 # +44 °C
1034  FM2_B13G_ba_6  =      21630; FM2_B13G_ba_err_6  =    219.633 # +44 °C
1035  FM2_B13G_bs_6  =    40.2982; FM2_B13G_bs_err_6  =    4.20407 # +44 °C
1036  FM2_B23G_ax_1  =    28.5998; FM2_B23G_ax_err_1  =    1.38991 # -7 °C
1037  FM2_B23G_ex_1  =  0.0882471; FM2_B23G_ex_err_1  = 0.000484609 # -7 °C
1038  FM2_B23G_sx_1  =   0.729721; FM2_B23G_sx_err_1  =  0.0562623 # -7 °C
1039  FM2_B23G_ba_1  =    6015.62; FM2_B23G_ba_err_1  =    91.3344 # -7 °C
1040  FM2_B23G_bs_1  =    19.8316; FM2_B23G_bs_err_1  =    1.63341 # -7 °C
1041  FM2_B23G_ax_2  =      26.58; FM2_B23G_ax_err_2  =    1.42792 # +7 °C
1042  FM2_B23G_ex_2  =  0.0896246; FM2_B23G_ex_err_2  = 0.000573969 # +7 °C
1043  FM2_B23G_sx_2  =   0.781216; FM2_B23G_sx_err_2  =  0.0658038 # +7 °C
1044  FM2_B23G_ba_2  =     6052.4; FM2_B23G_ba_err_2  =    95.7386 # +7 °C
1045  FM2_B23G_bs_2  =    19.5952; FM2_B23G_bs_err_2  =    1.68565 # +7 °C
1046  FM2_B23G_ax_3  =    29.8748; FM2_B23G_ax_err_3  =    1.51524 # +19 °C
1047  FM2_B23G_ex_3  =  0.0889773; FM2_B23G_ex_err_3  = 0.000515966 # +19 °C
1048  FM2_B23G_sx_3  =   0.789641; FM2_B23G_sx_err_3  =  0.0606134 # +19 °C
1049  FM2_B23G_ba_3  =    6212.97; FM2_B23G_ba_err_3  =    104.232 # +19 °C
1050  FM2_B23G_bs_3  =    22.2492; FM2_B23G_bs_err_3  =    2.23426 # +19 °C
1051  FM2_B23G_ax_4  =    32.1834; FM2_B23G_ax_err_4  =    2.17751 # +33 °C
1052  FM2_B23G_ex_4  =  0.0873813; FM2_B23G_ex_err_4  = 0.000612861 # +33 °C
1053  FM2_B23G_sx_4  =     0.9243; FM2_B23G_sx_err_4  =  0.0739313 # +33 °C
1054  FM2_B23G_ba_4  =    7171.62; FM2_B23G_ba_err_4  =    151.585 # +33 °C
1055  FM2_B23G_bs_4  =    22.9116; FM2_B23G_bs_err_4  =    2.83157 # +33 °C
1056  FM2_B23G_ax_5  =    15.0875; FM2_B23G_ax_err_5  =    1.45185 # +42 °C
1057  FM2_B23G_ex_5  =  0.0874392; FM2_B23G_ex_err_5  = 0.000888696 # +42 °C
1058  FM2_B23G_sx_5  =   0.879139; FM2_B23G_sx_err_5  =   0.106643 # +42 °C
1059  FM2_B23G_ba_5  =    3745.42; FM2_B23G_ba_err_5  =    99.4897 # +42 °C
1060  FM2_B23G_bs_5  =    20.4227; FM2_B23G_bs_err_5  =    2.91454 # +42 °C
1061  FM2_B23G_ax_6  =    30.8649; FM2_B23G_ax_err_6  =    2.30637 # +44 °C
1062  FM2_B23G_ex_6  =   0.086458; FM2_B23G_ex_err_6  = 0.000654648 # +44 °C
1063  FM2_B23G_sx_6  =    0.99455; FM2_B23G_sx_err_6  =  0.0788539 # +44 °C
1064  FM2_B23G_ba_6  =    6347.69; FM2_B23G_ba_err_6  =    160.849 # +44 °C
1065  FM2_B23G_bs_6  =     24.754; FM2_B23G_bs_err_6  =    3.81398 # +44 °C
1066  FM2_B13G_ac_1  =    1936.09; FM2_B13G_ac_err_1  =    57.9712 # -7 °C
1067  FM2_B13G_ec_1  =  0.0899886; FM2_B13G_ec_err_1  = 0.000124852 # -7 °C
1068  FM2_B13G_sc_1  =     1.40037; FM2_B13G_sc_err_1  =  0.0998796 # -7 °C
1069  FM2_B13G_bca_1 =    5222.33; FM2_B13G_bca_err_1 =    26.5159 # -7 °C
1070  FM2_B13G_bcs_1 =    20.7801; FM2_B13G_bcs_err_1 =    0.37632 # -7 °C
1071  FM2_B13G_ac_2  =    1799.78; FM2_B13G_ac_err_2  =    57.9229 # +7 °C
1072  FM2_B13G_ec_2  =  0.0902605; FM2_B13G_ec_err_2  = 0.000137377 # +7 °C
1073  FM2_B13G_sc_2  =     1.4752; FM2_B13G_sc_err_2  =    0.10995 # +7 °C
1074  FM2_B13G_bca_2 =    5008.97; FM2_B13G_bca_err_2 =    27.4896 # +7 °C
1075  FM2_B13G_bcs_2 =    20.3587; FM2_B13G_bcs_err_2 =   0.367991 # +7 °C
1076  FM2_B13G_ac_3  =    2097.95; FM2_B13G_ac_err_3  =    64.4315 # +19 °C
1077  FM2_B13G_ec_3  =  0.0903685; FM2_B13G_ec_err_3  = 0.000134885 # +19 °C
1078  FM2_B13G_sc_3  =    1.63975; FM2_B13G_sc_err_3  =   0.108032 # +19 °C
1079  FM2_B13G_bca_3 =    5437.88; FM2_B13G_bca_err_3 =    29.6595 # +19 °C
1080  FM2_B13G_bcs_3 =    20.9541; FM2_B13G_bcs_err_3 =   0.387202 # +19 °C
1081  FM2_B13G_ac_4  =    2494.12; FM2_B13G_ac_err_4  =    68.4538 # +33 °C
1082  FM2_B13G_ec_4  =  0.0906263; FM2_B13G_ec_err_4  = 0.000122072 # +33 °C
1083  FM2_B13G_sc_4  =    1.63704; FM2_B13G_sc_err_4  =  0.0975224 # +33 °C
1084  FM2_B13G_bca_4 =    6264.55; FM2_B13G_bca_err_4 =    31.4545 # +33 °C
1085  FM2_B13G_bcs_4 =    21.3314; FM2_B13G_bcs_err_4 =   0.365403 # +33 °C
1086  FM2_B13G_ac_5  =    1337.04; FM2_B13G_ac_err_5  =    55.7707 # +42 °C
1087  FM2_B13G_ec_5  =  0.0907698; FM2_B13G_ec_err_5  = 0.000192541 # +42 °C
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1088  FM2_B13G_sc_5  =     1.93398; FM2_B13G_sc_err_5  =    0.155459 # +42 °C
1089  FM2_B13G_bca_5 =     3230.14; FM2_B13G_bca_err_5 =     25.3972 # +42 °C
1090  FM2_B13G_bcs_5 =     21.2788; FM2_B13G_bcs_err_5 =    0.540532 # +42 °C
1091  FM2_B13G_ac_6  =     2039.31; FM2_B13G_ac_err_6  =     59.2064 # +44 °C
1092  FM2_B13G_ec_6  =  0.0906019; FM2_B13G_ec_err_6  = 0.000124125 # +44 °C
1093  FM2_B13G_sc_6  =     1.39377; FM2_B13G_sc_err_6  =   0.0986273 # +44 °C
1094  FM2_B13G_bca_6 =     5694.24; FM2_B13G_bca_err_6 =     28.5562 # +44 °C
1095  FM2_B13G_bcs_6 =     20.5281; FM2_B13G_bcs_err_6 =    0.335487 # +44 °C
1096  FM2_B23G_ac_1  =     315.007; FM2_B23G_ac_err_1  =     20.6673 # −7 °C
1097  FM2_B23G_ec_1  =  0.0892594; FM2_B23G_ec_err_1  = 0.000259279 # −7 °C
1098  FM2_B23G_sc_1  =     1.14975; FM2_B23G_sc_err_1  =    0.207249 # −7 °C
1099  FM2_B23G_bca_1 =     812.438; FM2_B23G_bca_err_1 =     10.6713 # −7 °C
1100  FM2_B23G_bcs_1 =     14.1916; FM2_B23G_bcs_err_1 =     0.41025 # −7 °C
1101  FM2_B23G_ac_2  =     376.587; FM2_B23G_ac_err_2  =     27.4741 # +7 °C
1102  FM2_B23G_ec_2  =  0.0905838; FM2_B23G_ec_err_2  = 0.000348232 # +7 °C
1103  FM2_B23G_sc_2  =     1.99346; FM2_B23G_sc_err_2  =     0.27618 # +7 °C
1104  FM2_B23G_bca_2 =     783.901; FM2_B23G_bca_err_2 =     13.9405 # +7 °C
1105  FM2_B23G_bcs_2 =     15.2032; FM2_B23G_bcs_err_2 =    0.535018 # +7 °C
1106  FM2_B23G_ac_3  =     369.832; FM2_B23G_ac_err_3  =     24.6692 # +19 °C
1107  FM2_B23G_ec_3  =  0.0905917; FM2_B23G_ec_err_3  = 0.000307466 # +19 °C
1108  FM2_B23G_sc_3  =     1.66666; FM2_B23G_sc_err_3  =    0.241621 # +19 °C
1109  FM2_B23G_bca_3 =     835.647; FM2_B23G_bca_err_3 =     12.8862 # +19 °C
1110  FM2_B23G_bcs_3 =     15.2994; FM2_B23G_bcs_err_3 =    0.484404 # +19 °C
1111  FM2_B23G_ac_4  =     377.541; FM2_B23G_ac_err_4  =     25.8423 # +33 °C
1112  FM2_B23G_ec_4  =  0.0905131; FM2_B23G_ec_err_4  = 0.000310876 # +33 °C
1113  FM2_B23G_sc_4  =     1.61975; FM2_B23G_sc_err_4  =    0.246471 # +33 °C
1114  FM2_B23G_bca_4 =      952.45; FM2_B23G_bca_err_4 =     14.5405 # +33 °C
1115  FM2_B23G_bcs_4 =     14.3006; FM2_B23G_bcs_err_4 =    0.394276 # +33 °C
1116  FM2_B23G_ac_5  =      228.28; FM2_B23G_ac_err_5  =     19.8254 # +42 °C
1117  FM2_B23G_ec_5  =  0.0906701; FM2_B23G_ec_err_5  = 0.000408241 # +42 °C
1118  FM2_B23G_sc_5  =     1.80693; FM2_B23G_sc_err_5  =    0.322729 # +42 °C
1119  FM2_B23G_bca_5 =     480.774; FM2_B23G_bca_err_5 =     10.1089 # +42 °C
1120  FM2_B23G_bcs_5 =      15.341; FM2_B23G_bcs_err_5 =    0.659616 # +42 °C
1121  FM2_B23G_ac_6  =     329.306; FM2_B23G_ac_err_6  =     20.8731 # +44 °C
1122  FM2_B23G_ec_6  =  0.0914047; FM2_B23G_ec_err_6  = 0.000283587 # +44 °C
1123  FM2_B23G_sc_6  =     1.31851; FM2_B23G_sc_err_6  =    0.221829 # +44 °C
1124  FM2_B23G_bca_6 =     830.924; FM2_B23G_bca_err_6 =     12.1465 # +44 °C
1125  FM2_B23G_bcs_6 =      14.222; FM2_B23G_bcs_err_6 =    0.359859 # +44 °C
1126  FM2_Bx3G_ee0   =   0.0905199; FM2_Bx3G_ee0_err   = 3.35143e-05
1127  FM2_Bx3G_ee1   = 9.73114e-06; FM2_Bx3G_ee1_err   = 1.26751e-06
1128  FM2_A11L_ratio_1  =     13.7037; FM2_A11L_ratio_err_1  = 9.99181e-06 # −7 °C 1
1129  FM2_A11L_ratio_2  =     14.0609; FM2_A11L_ratio_err_2  = 6.21081e-06 # +7 °C 1
1130  FM2_A11L_ratio_3  =     13.7336; FM2_A11L_ratio_err_3  = 9.61872e-06 # +19 °C 1
1131  FM2_A11L_ratio_4  =     13.7475; FM2_A11L_ratio_err_4  =  6.125e-06 # +33 °C 1
1132  FM2_A11L_ratio_5  =      13.873; FM2_A11L_ratio_err_5  = 5.98304e-06 # +42 °C 1
1133  FM2_A11L_ratio_6  =     13.8539; FM2_A11L_ratio_err_6  = 6.07092e-06 # +44 °C 1
1134  FM2_A12L_ratio_1  =     13.7411; FM2_A12L_ratio_err_1  = 4.84978e-06 # −7 °C 2
1135  FM2_A12L_ratio_2  =      13.854; FM2_A12L_ratio_err_2  = 3.92004e-06 # +7 °C 2
1136  FM2_A12L_ratio_3  =     13.6962; FM2_A12L_ratio_err_3  = 3.19321e-06 # +19 °C 2
1137  FM2_A12L_ratio_4  =      13.515; FM2_A12L_ratio_err_4  = 2.89182e-06 # +33 °C 2
1138  FM2_A12L_ratio_5  =     13.6834; FM2_A12L_ratio_err_5  = 3.22398e-06 # +42 °C 2
1139  FM2_A12L_ratio_6  =     13.5728; FM2_A12L_ratio_err_6  = 3.53771e-06 # +44 °C 2
1140  FM2_A21L_ratio_1  =     12.6118; FM2_A21L_ratio_err_1  = 7.83131e-06 # −7 °C 3
1141  FM2_A21L_ratio_2  =     12.8331; FM2_A21L_ratio_err_2  = 7.06948e-06 # +7 °C 3
1142  FM2_A21L_ratio_3  =     13.0259; FM2_A21L_ratio_err_3  = 5.73331e-06 # +19 °C 3
1143  FM2_A21L_ratio_4  =      13.011; FM2_A21L_ratio_err_4  = 5.20333e-06 # +33 °C 3
1144  FM2_A21L_ratio_5  =     12.7416; FM2_A21L_ratio_err_5  = 7.41751e-06 # +42 °C 3
1145  FM2_A21L_ratio_6  =     12.8221; FM2_A21L_ratio_err_6  = 6.23497e-06 # +44 °C 3
1146  FM2_A22L_ratio_1  =     13.3531; FM2_A22L_ratio_err_1  = 4.46176e-06 # −7 °C 4
1147  FM2_A22L_ratio_2  =     13.6237; FM2_A22L_ratio_err_2  = 3.8715e-06 # +7 °C 4
1148  FM2_A22L_ratio_3  =     13.8445; FM2_A22L_ratio_err_3  = 6.15353e-06 # +19 °C 4
1149  FM2_A22L_ratio_4  =     13.4974; FM2_A22L_ratio_err_4  = 3.2594e-06 # +33 °C 4
1150  FM2_A22L_ratio_5  =     13.7715; FM2_A22L_ratio_err_5  = 4.12093e-06 # +42 °C 4
1151  FM2_A22L_ratio_6  =     13.7457; FM2_A22L_ratio_err_6  = 2.6034e-06 # +44 °C 4
1152  FM2_B11L_ratio_1  =     14.2226; FM2_B11L_ratio_err_1  = 2.52265e-05 # −7 °C 5
1153  FM2_B11L_ratio_2  =     14.0374; FM2_B11L_ratio_err_2  =  6.875e-06 # +7 °C 5
1154  FM2_B11L_ratio_3  =     13.8721; FM2_B11L_ratio_err_3  = 7.34689e-06 # +19 °C 5
1155  FM2_B11L_ratio_4  =     13.7032; FM2_B11L_ratio_err_4  = 1.5667e-05 # +33 °C 5
1156  FM2_B11L_ratio_5  =     13.9579; FM2_B11L_ratio_err_5  = 1.18713e-05 # +42 °C 5
1157  FM2_B11L_ratio_6  =     13.9072; FM2_B11L_ratio_err_6  = 5.26983e-06 # +44 °C 5
1158  FM2_B12L_ratio_1  =     13.4259; FM2_B12L_ratio_err_1  = 3.92588e-06 # −7 °C 6
1159  FM2_B12L_ratio_2  =     13.3318; FM2_B12L_ratio_err_2  = 6.8916e-06 # +7 °C 6
1160  FM2_B12L_ratio_3  =     13.4444; FM2_B12L_ratio_err_3  = 5.93651e-06 # +19 °C 6
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FM2_B12L_ratio_4  =    13.5988; FM2_B12L_ratio_err_4  = 3.28896e-06 # +33 °C 6
FM2_B12L_ratio_5  =    13.3709; FM2_B12L_ratio_err_5  = 5.79571e-06 # +42 °C 6
FM2_B12L_ratio_6  =    13.3627; FM2_B12L_ratio_err_6  = 2.74645e-06 # +44 °C 6
FM2_B21L_ratio_1  =    13.8613; FM2_B21L_ratio_err_1  = 1.98182e-05 # -7 °C 7
FM2_B21L_ratio_2  =    13.9068; FM2_B21L_ratio_err_2  = 7.58238e-06 # +7 °C 7
FM2_B21L_ratio_3  =    14.1366; FM2_B21L_ratio_err_3  = 1.62906e-05 # +19 °C 7
FM2_B21L_ratio_4  =    13.5708; FM2_B21L_ratio_err_4  = 1.59378e-05 # +33 °C 7
FM2_B21L_ratio_5  =    13.8959; FM2_B21L_ratio_err_5  = 1.18055e-05 # +42 °C 7
FM2_B21L_ratio_6  =    13.8423; FM2_B21L_ratio_err_6  = 8.49316e-06 # +44 °C 7
FM2_B22L_ratio_1  =    13.7033; FM2_B22L_ratio_err_1  = 6.58989e-06 # -7 °C 8
FM2_B22L_ratio_2  =     14.047; FM2_B22L_ratio_err_2  = 5.36555e-06 # +7 °C 8
FM2_B22L_ratio_3  =    13.9871; FM2_B22L_ratio_err_3  = 4.60248e-06 # +19 °C 8
FM2_B22L_ratio_4  =    13.9597; FM2_B22L_ratio_err_4  = 3.53244e-06 # +33 °C 8
FM2_B22L_ratio_5  =    13.8216; FM2_B22L_ratio_err_5  = 6.37522e-06 # +42 °C 8
FM2_B22L_ratio_6  =    13.9612; FM2_B22L_ratio_err_6  = 9.01923e-06 # +44 °C 8
FM2_A11L_ee0 =    13.8903; FM2_A11L_ee0_err = 5.6133e-06
FM2_A11L_ee1 = 0.00734934; FM2_A11L_ee1_err = 4.21679e-06
FM2_A11L_ee2 =   -4.25113; FM2_A11L_ee2_err = 0.000934522
FM2_A12L_ee0 =    13.7822; FM2_A12L_ee0_err = 2.91079e-06
FM2_A12L_ee1 = -0.0440766; FM2_A12L_ee1_err = 1.93866e-06
FM2_A12L_ee2 =    2.70233; FM2_A12L_ee2_err = 0.00043171
FM2_A21L_ee0 =     12.763; FM2_A21L_ee0_err = 4.85508e-06
FM2_A21L_ee1 =   0.179593; FM2_A21L_ee1_err = 3.57303e-06
FM2_A21L_ee2 =   -39.5043; FM2_A21L_ee2_err = 0.000818672
FM2_A22L_ee0 =     13.485; FM2_A22L_ee0_err = 2.82562e-06
FM2_A22L_ee1 =  0.0569406; FM2_A22L_ee1_err = 2.12952e-06
FM2_A22L_ee2 =   -4.2119; FM2_A22L_ee2_err = 0.000490269
FM2_B11L_ee0 =    14.1566; FM2_B11L_ee0_err = 1.02159e-05
FM2_B11L_ee1 =  -0.156279; FM2_B11L_ee1_err = 7.37777e-06
FM2_B11L_ee2 =    26.5575; FM2_B11L_ee2_err = 0.00142278
FM2_B12L_ee0 =    13.4658; FM2_B12L_ee0_err = 2.98579e-06
FM2_B12L_ee1 =  0.0678551; FM2_B12L_ee1_err = 2.05138e-06
FM2_B12L_ee2 =   -18.3651; FM2_B12L_ee2_err = 0.000509082
FM2_B21L_ee0 =    13.9076; FM2_B21L_ee0_err = 9.4133e-06
FM2_B21L_ee1 =  0.0105127; FM2_B21L_ee1_err = 8.39602e-06
FM2_B21L_ee2 =   -5.24063; FM2_B21L_ee2_err = 0.00175965
FM2_B22L_ee0 =    13.8736; FM2_B22L_ee0_err = 3.97906e-06
FM2_B22L_ee1 =   0.105877; FM2_B22L_ee1_err = 2.76236e-06
FM2_B22L_ee2 =   -25.7157; FM2_B22L_ee2_err = 0.000677279
FM2_HL_e0 =   0.998846; FM2_HL_e0_err = 1.35632e-06
FM2_HL_e1 =  0.0353143; FM2_HL_e1_err = 1.29952e-05
FM2_HL_e2 =   -8.02093; FM2_HL_e2_err = 0.00296536
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3.6 FM room temperature results

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# Di 1. Nov 18:25:11 CET 2016
FM1_1_BB_C_e  =     911.503; FM1_1_BB_C_e_err  =     7.27014 # 23.34 °C
FM1_1_BB_C_a  =     82.0215; FM1_1_BB_C_a_err  =     6.37224 # 23.34 °C
FM1_1_BB_C_s  =     72.9232; FM1_1_BB_C_s_err  =     4.93463 # 23.34 °C
FM1_2_BB_C_e  =      930.65; FM1_2_BB_C_e_err  =     8.37663 # 23.15 °C
FM1_2_BB_C_a  =     70.7701; FM1_2_BB_C_a_err  =     5.64457 # 23.15 °C
FM1_2_BB_C_s  =     78.3075; FM1_2_BB_C_s_err  =      5.4993 # 23.15 °C
FM1_3_BB_C_e  =     913.668; FM1_3_BB_C_e_err  =     7.12395 # 23.60 °C
FM1_3_BB_C_a  =     84.5274; FM1_3_BB_C_a_err  =     6.33147 # 23.60 °C
FM1_3_BB_C_s  =     71.3113; FM1_3_BB_C_s_err  =     4.59334 # 23.60 °C
FM1_4_BB_C_e  =     938.749; FM1_4_BB_C_e_err  =     8.01989 # 23.58 °C
FM1_4_BB_C_a  =     73.2506; FM1_4_BB_C_a_err  =     5.82359 # 23.58 °C
FM1_4_BB_C_s  =     75.0283; FM1_4_BB_C_s_err  =     5.20581 # 23.58 °C
FM2_1_BB_C_e  =     915.551; FM2_1_BB_C_e_err  =     7.60289 # 24.24 °C
FM2_1_BB_C_a  =      75.066; FM2_1_BB_C_a_err  =     6.18326 # 24.24 °C
FM2_1_BB_C_s  =     71.5619; FM2_1_BB_C_s_err  =     5.18069 # 24.24 °C
FM2_2_BB_C_e  =     902.101; FM2_2_BB_C_e_err  =     7.53791 # 24.44 °C
FM2_2_BB_C_a  =     76.5533; FM2_2_BB_C_a_err  =     6.20598 # 24.44 °C
FM2_2_BB_C_s  =     70.7491; FM2_2_BB_C_s_err  =     4.99956 # 24.44 °C
FM2_3_BB_C_e  =     878.723; FM2_3_BB_C_e_err  =     16.4657 # 24.07 °C
FM2_3_BB_C_a  =     20.0385; FM2_3_BB_C_a_err  =     4.67943 # 24.07 °C
FM2_3_BB_C_s  =     49.8726; FM2_3_BB_C_s_err  =      11.768 # 24.07 °C
FM2_4_BB_C_e  =     875.536; FM2_4_BB_C_e_err  =     19.0268 # 23.91 °C
FM2_4_BB_C_a  =     18.9172; FM2_4_BB_C_a_err  =     4.19449 # 23.91 °C
FM2_4_BB_C_s  =      60.526; FM2_4_BB_C_s_err  =     13.7955 # 23.91 °C
FM1_1_C1_ax =    0.502236; FM1_1_C1_ax_err =    0.145537
FM1_1_C1_ex =   0.0927541; FM1_1_C1_ex_err = 0.00120215
FM1_1_C1_sx =    0.265597; FM1_1_C1_sx_err =   0.0811737
FM1_1_C1_ba =     36.9721; FM1_1_C1_ba_err =     1.69525
FM1_1_C1_bs =     6.83438; FM1_1_C1_bs_err =    0.757051
FM1_2_C1_ax =     37.8285; FM1_2_C1_ax_err =    0.959389
FM1_2_C1_ex =     0.10304; FM1_2_C1_ex_err = 9.36243e-05
FM1_2_C1_sx =    0.248846; FM1_2_C1_sx_err = 0.00658845
FM1_2_C1_ba =     1006.93; FM1_2_C1_ba_err =     7.93032
FM1_2_C1_bs =     8.99929; FM1_2_C1_bs_err =    0.227528
FM1_3_C1_ax =     15.9597; FM1_3_C1_ax_err =     0.55012
FM1_3_C1_ex =    0.102949; FM1_3_C1_ex_err = 0.00013907
FM1_3_C1_sx =    0.268473; FM1_3_C1_sx_err = 0.00903381
FM1_3_C1_ba =     287.449; FM1_3_C1_ba_err =     4.37459
FM1_3_C1_bs =     8.81872; FM1_3_C1_bs_err =    0.416903
FM1_4_C1_ax =     10.5562; FM1_4_C1_ax_err =    0.507203
FM1_4_C1_ex =    0.102958; FM1_4_C1_ex_err = 0.000208071
FM1_4_C1_sx =    0.289212; FM1_4_C1_sx_err =    0.014059
FM1_4_C1_ba =     362.387; FM1_4_C1_ba_err =     4.85041
FM1_4_C1_bs =     7.69597; FM1_4_C1_bs_err =    0.280739
FM2_1_C1_ax =    0.125675; FM2_1_C1_ax_err =   0.0800556
FM2_1_C1_ex =    0.111724; FM2_1_C1_ex_err = 0.00536239
FM2_1_C1_sx =    0.524487; FM2_1_C1_sx_err =    0.411885
FM2_1_C1_ba =     24.5441; FM2_1_C1_ba_err =     2.45981
FM2_1_C1_bs =     5.38979; FM2_1_C1_bs_err =    0.577261
FM2_2_C1_ax =     11.8548; FM2_2_C1_ax_err =    0.412232
FM2_2_C1_ex =     0.10204; FM2_2_C1_ex_err = 0.00039137
FM2_2_C1_sx =    0.730976; FM2_2_C1_sx_err =   0.0327024
FM2_2_C1_ba =     740.393; FM2_2_C1_ba_err =     8.51982
FM2_2_C1_bs =     8.15025; FM2_2_C1_bs_err =    0.236271
FM1_1_C2_ax =    0.265715; FM1_1_C2_ax_err =    0.111808
FM1_1_C2_ex =   0.0970075; FM1_1_C2_ex_err = 0.00271339
FM1_1_C2_sx =    0.376981; FM1_1_C2_sx_err =    0.175947
FM1_1_C2_ba =     35.8063; FM1_1_C2_ba_err =     1.96253
FM1_1_C2_bs =     5.87966; FM1_1_C2_bs_err =    0.569409
FM1_2_C2_ax =     24.8956; FM1_2_C2_ax_err =    0.713248
FM1_2_C2_ex =    0.102593; FM1_2_C2_ex_err = 0.00018765
FM1_2_C2_sx =    0.439522; FM1_2_C2_sx_err =   0.0135223
FM1_2_C2_ba =     1035.61; FM1_2_C2_ba_err =     8.48743
FM1_2_C2_bs =     8.71444; FM1_2_C2_bs_err =    0.212501
FM1_3_C2_ax =     9.50854; FM1_3_C2_ax_err =    0.406559
FM1_3_C2_ex =    0.103741; FM1_3_C2_ex_err = 0.000307742
FM1_3_C2_sx =    0.484198; FM1_3_C2_sx_err =   0.0225649
FM1_3_C2_ba =     321.648; FM1_3_C2_ba_err =     4.85727
FM1_3_C2_bs =      8.9097; FM1_3_C2_bs_err =    0.406722
FM1_4_C2_ax =     6.49452; FM1_4_C2_ax_err =    0.354773
FM1_4_C2_ex =     0.10199; FM1_4_C2_ex_err = 0.000442944
FM1_4_C2_sx =    0.548338; FM1_4_C2_sx_err =   0.0348988
FM1_4_C2_ba =     328.944; FM1_4_C2_ba_err =     5.06779
FM1_4_C2_bs =     8.11296; FM1_4_C2_bs_err =    0.337306
FM2_1_C2_ax = 0.00577505; FM2_1_C2_ax_err =   0.0710277
FM2_1_C2_ex =    0.123608; FM2_1_C2_ex_err =    0.105218
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FM2_1_C2_sx =    0.506768; FM2_1_C2_sx_err =     7.37742
FM2_1_C2_ba =     22.7642; FM2_1_C2_ba_err =     28.9753
FM2_1_C2_bs =     6.26248; FM2_1_C2_bs_err =    0.860682
FM2_2_C2_ax =     19.4687; FM2_2_C2_ax_err =    0.603143
FM2_2_C2_ex =   0.0997949; FM2_2_C2_ex_err = 0.00023592
FM2_2_C2_sx =    0.513743; FM2_2_C2_sx_err =   0.0180157
FM2_2_C2_ba =     823.334; FM2_2_C2_ba_err =     7.89919
FM2_2_C2_bs =     7.58917; FM2_2_C2_bs_err =    0.188047
FM1_1_C3_ax =    0.579846; FM1_1_C3_ax_err =    0.131932
FM1_1_C3_ex =   0.0878605; FM1_1_C3_ex_err = 0.00200824
FM1_1_C3_sx =    0.542536; FM1_1_C3_sx_err =     0.15798
FM1_1_C3_ba =     63.2894; FM1_1_C3_ba_err =      2.8625
FM1_1_C3_bs =     5.47231; FM1_1_C3_bs_err =    0.427762
FM1_2_C3_ax =     4.86416; FM1_2_C3_ax_err =     0.33046
FM1_2_C3_ex =   0.0888776; FM1_2_C3_ex_err = 0.000858334
FM1_2_C3_sx =    0.758393; FM1_2_C3_sx_err =   0.0764106
FM1_2_C3_ba =     705.724; FM1_2_C3_ba_err =     10.8224
FM1_2_C3_bs =     9.16001; FM1_2_C3_bs_err =    0.384712
FM1_3_C3_ax =     102.477; FM1_3_C3_ax_err =      1.2739
FM1_3_C3_ex =    0.104247; FM1_3_C3_ex_err = 6.35105e-05
FM1_3_C3_sx =    0.340865; FM1_3_C3_sx_err = 0.00409299
FM1_3_C3_ba =     1803.87; FM1_3_C3_ba_err =     11.2263
FM1_3_C3_bs =     6.87898; FM1_3_C3_bs_err =    0.101888
FM1_4_C3_ax =     12.2817; FM1_4_C3_ax_err =    0.494139
FM1_4_C3_ex =    0.102935; FM1_4_C3_ex_err = 0.000255277
FM1_4_C3_sx =     0.41304; FM1_4_C3_sx_err =   0.0174205
FM1_4_C3_ba =     469.672; FM1_4_C3_ba_err =     5.77883
FM1_4_C3_bs =     6.84134; FM1_4_C3_bs_err =    0.196042
FM2_1_C3_ax =    0.791804; FM2_1_C3_ax_err =    0.472386
FM2_1_C3_ex =   0.0807766; FM2_1_C3_ex_err = 0.00566476
FM2_1_C3_sx =      1.7529; FM2_1_C3_sx_err =    0.623976
FM2_1_C3_ba =     29.6513; FM2_1_C3_ba_err =     33.5902
FM2_1_C3_bs =     102.919; FM2_1_C3_bs_err =      2142.8
FM2_2_C3_ax =     6.34943; FM2_2_C3_ax_err =    0.431125
FM2_2_C3_ex =   0.0859705; FM2_2_C3_ex_err = 0.00108759
FM2_2_C3_sx =     1.11507; FM2_2_C3_sx_err =    0.107247
FM2_2_C3_ba =     741.604; FM2_2_C3_ba_err =     28.0292
FM2_2_C3_bs =     13.3093; FM2_2_C3_bs_err =     1.63674
FM1_1_C4_ax =    0.519943; FM1_1_C4_ax_err =    0.114173
FM1_1_C4_ex =    0.090628; FM1_1_C4_ex_err = 0.00214609
FM1_1_C4_sx =    0.618293; FM1_1_C4_sx_err =    0.179989
FM1_1_C4_ba =      53.628; FM1_1_C4_ba_err =     2.53128
FM1_1_C4_bs =     6.10519; FM1_1_C4_bs_err =    0.554616
FM1_2_C4_ax =     5.11584; FM1_2_C4_ax_err =     0.44053
FM1_2_C4_ex =   0.0865162; FM1_2_C4_ex_err = 0.00136017
FM1_2_C4_sx =     1.21802; FM1_2_C4_sx_err =    0.132536
FM1_2_C4_ba =     569.641; FM1_2_C4_ba_err =     29.5584
FM1_2_C4_bs =     15.4251; FM1_2_C4_bs_err =     2.87879
FM1_3_C4_ax =     124.893; FM1_3_C4_ax_err =     1.50412
FM1_3_C4_ex =    0.103466; FM1_3_C4_ex_err = 4.56333e-05
FM1_3_C4_sx =    0.258358; FM1_3_C4_sx_err = 0.00302186
FM1_3_C4_ba =     1790.42; FM1_3_C4_ba_err =     11.0046
FM1_3_C4_bs =     6.92045; FM1_3_C4_bs_err =    0.103519
FM1_4_C4_ax =     17.3762; FM1_4_C4_ax_err =      0.6172
FM1_4_C4_ex =     0.10336; FM1_4_C4_ex_err = 0.000133274
FM1_4_C4_sx =    0.255531; FM1_4_C4_sx_err = 0.00930292
FM1_4_C4_ba =     382.401; FM1_4_C4_ba_err =     4.96345
FM1_4_C4_bs =     7.41559; FM1_4_C4_bs_err =    0.252762
FM2_1_C4_ax =    0.905983; FM2_1_C4_ax_err =    0.595559
FM2_1_C4_ex =   0.0741103; FM2_1_C4_ex_err = 0.00564081
FM2_1_C4_sx =      2.1413; FM2_1_C4_sx_err =     0.64307
FM2_1_C4_ba =     21.1953; FM2_1_C4_ba_err =     42.4866
FM2_1_C4_bs =     321.059; FM2_1_C4_bs_err =     32421.8
FM2_2_C4_ax =     4.95888; FM2_2_C4_ax_err =    0.339872
FM2_2_C4_ex =   0.0867552; FM2_2_C4_ex_err = 0.000957717
FM2_2_C4_sx =    0.813464; FM2_2_C4_sx_err =   0.0885811
FM2_2_C4_ba =     809.212; FM2_2_C4_ba_err =     14.0925
FM2_2_C4_bs =     10.1927; FM2_2_C4_bs_err =    0.531428
FM1_1_A1_ax =     1.41542; FM1_1_A1_ax_err =     4.93166
FM1_1_A1_ex =   0.0714951; FM1_1_A1_ex_err =   0.0861584
FM1_1_A1_sx =     1.20232; FM1_1_A1_sx_err =     2.65674
FM1_1_A1_ba =     134.345; FM1_1_A1_ba_err =     78.0217
FM1_1_A1_bs =     8.78511; FM1_1_A1_bs_err =     4.27313
FM1_2_A1_ax =     67.0497; FM1_2_A1_ax_err =     1.59823
FM1_2_A1_ex =    0.100861; FM1_2_A1_ex_err = 0.000182465
FM1_2_A1_sx =    0.616562; FM1_2_A1_sx_err =   0.0201204
FM1_2_A1_ba =     3014.51; FM1_2_A1_ba_err =      98.061
FM1_2_A1_bs =     13.9209; FM1_2_A1_bs_err =     1.94159
FM1_3_A1_ax =     25.6615; FM1_3_A1_ax_err =    0.857376
FM1_3_A1_ex =    0.102114; FM1_3_A1_ex_err = 0.00022023
FM1_3_A1_sx =    0.498865; FM1_3_A1_sx_err =   0.0220714
FM1_3_A1_ba =     928.207; FM1_3_A1_ba_err =     42.9736
FM1_3_A1_bs =     10.4304; FM1_3_A1_bs_err =     1.64414
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FM1_4_A1_ax =     18.2263; FM1_4_A1_ax_err =    0.946267
FM1_4_A1_ex =    0.101058; FM1_4_A1_ex_err = 0.000370556
FM1_4_A1_sx =    0.562754; FM1_4_A1_sx_err =   0.0388204
FM1_4_A1_ba =     1153.75; FM1_4_A1_ba_err =     54.9747
FM1_4_A1_bs =     8.72051; FM1_4_A1_bs_err =     1.17347
FM2_1_A1_ax =     7.98232; FM2_1_A1_ax_err =     416.351
FM2_1_A1_ex = -0.0280932; FM2_1_A1_ex_err =     2.85662
FM2_1_A1_sx =     4.28852; FM2_1_A1_sx_err =     59.5733
FM2_1_A1_ba =     99.3827; FM2_1_A1_ba_err =     798.535
FM2_1_A1_bs =     18.9039; FM2_1_A1_bs_err =     418.116
FM2_2_A1_ax =     53.1088; FM2_2_A1_ax_err =     1.39116
FM2_2_A1_ex =   0.0955861; FM2_2_A1_ex_err = 0.000247617
FM2_2_A1_sx =    0.539212; FM2_2_A1_sx_err =   0.0214902
FM2_2_A1_ba =     2441.44; FM2_2_A1_ba_err =     68.3096
FM2_2_A1_bs =     9.93515; FM2_2_A1_bs_err =    0.830286
FM1_1_A2_ax =    0.830681; FM1_1_A2_ax_err =      0.3393
FM1_1_A2_ex =   0.0881979; FM1_1_A2_ex_err =   0.0183405
FM1_1_A2_sx =    0.723786; FM1_1_A2_sx_err =    0.997597
FM1_1_A2_ba =     113.296; FM1_1_A2_ba_err =     16.8372
FM1_1_A2_bs =     11.7323; FM1_1_A2_bs_err =     5.71098
FM1_2_A2_ax =     97.5724; FM1_2_A2_ax_err =      1.8678
FM1_2_A2_ex =    0.101534; FM1_2_A2_ex_err = 7.67306e-05
FM1_2_A2_sx =    0.289899; FM1_2_A2_sx_err = 0.00641587
FM1_2_A2_ba =      4366.2; FM1_2_A2_ba_err =     51.2484
FM1_2_A2_bs =     5.55017; FM1_2_A2_bs_err =    0.133933
FM1_3_A2_ax =     29.5443; FM1_3_A2_ax_err =     0.98534
FM1_3_A2_ex =    0.101623; FM1_3_A2_ex_err = 0.00014688
FM1_3_A2_sx =    0.318066; FM1_3_A2_sx_err =    0.012208
FM1_3_A2_ba =     1249.11; FM1_3_A2_ba_err =     29.6741
FM1_3_A2_bs =     6.03144; FM1_3_A2_bs_err =    0.313042
FM1_4_A2_ax =     23.9215; FM1_4_A2_ax_err =    0.983676
FM1_4_A2_ex =    0.101242; FM1_4_A2_ex_err = 0.000164731
FM1_4_A2_sx =    0.286477; FM1_4_A2_sx_err =   0.0138821
FM1_4_A2_ba =     1291.28; FM1_4_A2_ba_err =     28.0547
FM1_4_A2_bs =     5.34837; FM1_4_A2_bs_err =    0.231631
FM2_1_A2_ax =     1.21562; FM2_1_A2_ax_err =     2.65429
FM2_1_A2_ex =   0.0797264; FM2_1_A2_ex_err =   0.0569282
FM2_1_A2_sx =    0.790786; FM2_1_A2_sx_err =      2.0601
FM2_1_A2_ba =     87.8257; FM2_1_A2_ba_err =     21.7076
FM2_1_A2_bs =     14.0024; FM2_1_A2_bs_err =     8.37976
FM2_2_A2_ax =     83.4891; FM2_2_A2_ax_err =      1.5553
FM2_2_A2_ex =    0.104133; FM2_2_A2_ex_err = 8.24706e-05
FM2_2_A2_sx =    0.319572; FM2_2_A2_sx_err = 0.00630055
FM2_2_A2_ba =     3016.97; FM2_2_A2_ba_err =     37.7548
FM2_2_A2_bs =      6.0998; FM2_2_A2_bs_err =    0.175513
FM1_1_A3_ax =     2.72805; FM1_1_A3_ax_err =     1.53139
FM1_1_A3_ex =   0.0862497; FM1_1_A3_ex_err = 0.00187247
FM1_1_A3_sx =    0.256081; FM1_1_A3_sx_err =   0.0731687
FM1_1_A3_ba =      209.17; FM1_1_A3_ba_err =     12.3807
FM1_1_A3_bs =     6.43884; FM1_1_A3_bs_err =    0.779421
FM1_2_A3_ax =    -11.5678; FM1_2_A3_ax_err =     10.1253
FM1_2_A3_ex =    0.108557; FM1_2_A3_ex_err =   0.0164038
FM1_2_A3_sx =     1.85229; FM1_2_A3_sx_err =     1.00246
FM1_2_A3_ba =     2887.98; FM1_2_A3_ba_err =     1325.63
FM1_2_A3_bs =      5.5333; FM1_2_A3_bs_err =      0.8957
FM1_3_A3_ax =     248.357; FM1_3_A3_ax_err =     2.43394
FM1_3_A3_ex =    0.103434; FM1_3_A3_ex_err = 5.14044e-05
FM1_3_A3_sx =    0.370376; FM1_3_A3_sx_err = 0.00402729
FM1_3_A3_ba =     6820.77; FM1_3_A3_ba_err =     71.7651
FM1_3_A3_bs =     5.04971; FM1_3_A3_bs_err =   0.0985167
FM1_4_A3_ax =     26.7193; FM1_4_A3_ax_err =     1.00752
FM1_4_A3_ex =    0.103555; FM1_4_A3_ex_err = 0.000190728
FM1_4_A3_sx =    0.351416; FM1_4_A3_sx_err =   0.0150415
FM1_4_A3_ba =     1678.01; FM1_4_A3_ba_err =     30.0372
FM1_4_A3_bs =     5.10896; FM1_4_A3_bs_err =    0.177716
FM2_1_A3_ax =     1.61113; FM2_1_A3_ax_err =     1.24892
FM2_1_A3_ex =   0.0839073; FM2_1_A3_ex_err =   0.0272186
FM2_1_A3_sx =     0.75981; FM2_1_A3_sx_err =     1.18085
FM2_1_A3_ba =      162.89; FM2_1_A3_ba_err =     37.0574
FM2_1_A3_bs =     7.38368; FM2_1_A3_bs_err =     2.04594
FM2_2_A3_ax =    -8.02066; FM2_2_A3_ax_err =     1.10832
FM2_2_A3_ex =    0.121571; FM2_2_A3_ex_err = 0.00242176
FM2_2_A3_sx =     1.25034; FM2_2_A3_sx_err =    0.233955
FM2_2_A3_ba =     2695.41; FM2_2_A3_ba_err =     131.209
FM2_2_A3_bs =     7.24106; FM2_2_A3_bs_err =    0.348233
FM1_1_A4_ax =     1.62438; FM1_1_A4_ax_err =     1.36102
FM1_1_A4_ex =   0.0865922; FM1_1_A4_ex_err = 0.00786869
FM1_1_A4_sx =    0.359531; FM1_1_A4_sx_err =    0.154177
FM1_1_A4_ba =      195.63; FM1_1_A4_ba_err =     23.4626
FM1_1_A4_bs =     6.91447; FM1_1_A4_bs_err =    0.971233
FM1_2_A4_ax =    -11.1074; FM1_2_A4_ax_err =     8.83877
FM1_2_A4_ex =     0.10683; FM1_2_A4_ex_err =   0.0155315
FM1_2_A4_sx =     1.99004; FM1_2_A4_sx_err =    0.960184
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FM1_2_A4_ba =     2810.71; FM1_2_A4_ba_err =      1150.7
FM1_2_A4_bs =     5.86829; FM1_2_A4_bs_err =    0.832044
FM1_3_A4_ax =     201.995; FM1_3_A4_ax_err =     2.29913
FM1_3_A4_ex =    0.101115; FM1_3_A4_ex_err = 9.30555e-05
FM1_3_A4_sx =    0.634317; FM1_3_A4_sx_err =   0.0101038
FM1_3_A4_ba =     4961.46; FM1_3_A4_ba_err =     141.081
FM1_3_A4_bs =     12.1848; FM1_3_A4_bs_err =     1.27474
FM1_4_A4_ax =     24.8218; FM1_4_A4_ax_err =     1.03374
FM1_4_A4_ex =   0.0981625; FM1_4_A4_ex_err = 0.000498805
FM1_4_A4_sx =    0.794108; FM1_4_A4_sx_err =   0.0497465
FM1_4_A4_ba =     962.567; FM1_4_A4_ba_err =     73.6834
FM1_4_A4_bs =      19.372; FM1_4_A4_bs_err =     7.96347
FM2_1_A4_ax =      73.378; FM2_1_A4_ax_err =     1766.17
FM2_1_A4_ex =   0.0125465; FM2_1_A4_ex_err =     0.49033
FM2_1_A4_sx =     2.15296; FM2_1_A4_sx_err =     6.79022
FM2_1_A4_ba =      355.99; FM2_1_A4_ba_err =     1674.79
FM2_1_A4_bs =     6.93339; FM2_1_A4_bs_err =      3.5931
FM2_2_A4_ax =    -15.9205; FM2_2_A4_ax_err =     9.87732
FM2_2_A4_ex =    0.114166; FM2_2_A4_ex_err =   0.0109022
FM2_2_A4_sx =     2.08459; FM2_2_A4_sx_err =    0.745098
FM2_2_A4_ba =     3529.46; FM2_2_A4_ba_err =     1111.67
FM2_2_A4_bs =     6.35387; FM2_2_A4_bs_err =    0.776304
FM1_2_C1_ac =     116.365; FM1_2_C1_ac_err =     3.98928
FM1_2_C1_ec =     0.10239; FM1_2_C1_ec_err = 0.000207007
FM1_2_C1_sc =    0.946175; FM1_2_C1_sc_err =    0.159226
FM1_2_C1_bca =     106.607; FM1_2_C1_bca_err =     1.76855
FM1_2_C1_bcs =     22.3747; FM1_2_C1_bcs_err =    0.726963
FM2_2_C1_ac =     71.5347; FM2_2_C1_ac_err =     3.18382
FM2_2_C1_ec =    0.105373; FM2_2_C1_ec_err = 0.000281662
FM2_2_C1_sc =    0.984701; FM2_2_C1_sc_err =    0.222977
FM2_2_C1_bca =     71.3236; FM2_2_C1_bca_err =     1.45826
FM2_2_C1_bcs =     22.5928; FM2_2_C1_bcs_err =    0.834526
FM1_2_C2_ac =     94.3418; FM1_2_C2_ac_err =     3.54156
FM1_2_C2_ec =    0.106274; FM1_2_C2_ec_err = 0.000237051
FM1_2_C2_sc =     0.94718; FM1_2_C2_sc_err =    0.180067
FM1_2_C2_bca =     91.4545; FM1_2_C2_bca_err =     1.65441
FM1_2_C2_bcs =     20.6488; FM1_2_C2_bcs_err =    0.585019
FM2_2_C2_ac =     70.9115; FM2_2_C2_ac_err =     3.01636
FM2_2_C2_ec =     0.10305; FM2_2_C2_ec_err = 0.000214723
FM2_2_C2_sc =    0.593773; FM2_2_C2_sc_err =    0.160852
FM2_2_C2_bca =     69.9631; FM2_2_C2_bca_err =     1.34374
FM2_2_C2_bcs =     20.3832; FM2_2_C2_bcs_err =    0.697687
FM1_2_C3_ac =      47.291; FM1_2_C3_ac_err =     2.69868
FM1_2_C3_ec =    0.103505; FM1_2_C3_ec_err = 0.000373038
FM1_2_C3_sc =     1.09008; FM1_2_C3_sc_err =    0.292704
FM1_2_C3_bca =     47.9232; FM1_2_C3_bca_err =     1.25647
FM1_2_C3_bcs =     18.8045; FM1_2_C3_bcs_err =    0.732041
FM2_2_C3_ac =     54.5484; FM2_2_C3_ac_err =     2.76013
FM2_2_C3_ec =    0.104664; FM2_2_C3_ec_err = 0.000305619
FM2_2_C3_sc =    0.868969; FM2_2_C3_sc_err =    0.240245
FM2_2_C3_bca =     56.8242; FM2_2_C3_bca_err =     1.29849
FM2_2_C3_bcs =     17.7425; FM2_2_C3_bcs_err =    0.549888
FM1_2_C4_ac =     62.9403; FM1_2_C4_ac_err =     3.48909
FM1_2_C4_ec =    0.102371; FM1_2_C4_ec_err = 0.00040475
FM1_2_C4_sc =     1.49221; FM1_2_C4_sc_err =    0.318501
FM1_2_C4_bca =     69.1953; FM1_2_C4_bca_err =     1.61786
FM1_2_C4_bcs =     19.8916; FM1_2_C4_bcs_err =    0.741043
FM2_2_C4_ac =     82.2356; FM2_2_C4_ac_err =      4.1435
FM2_2_C4_ec =    0.104141; FM2_2_C4_ec_err = 0.000412659
FM2_2_C4_sc =     1.90723; FM2_2_C4_sc_err =    0.313963
FM2_2_C4_bca =     87.4196; FM2_2_C4_bca_err =     1.95411
FM2_2_C4_bcs =     21.5235; FM2_2_C4_bcs_err =    0.771273
FM1_2_A1_ac =     338.858; FM1_2_A1_ac_err =     7.28764
FM1_2_A1_ec =    0.104186; FM1_2_A1_ec_err = 0.000136665
FM1_2_A1_sc =     1.00562; FM1_2_A1_sc_err =    0.104103
FM1_2_A1_bca =     367.943; FM1_2_A1_bca_err =     3.32927
FM1_2_A1_bcs =     21.3461; FM1_2_A1_bcs_err =    0.339411
FM2_2_A1_ac =     236.886; FM2_2_A1_ac_err =     6.47386
FM2_2_A1_ec =   0.0993793; FM2_2_A1_ec_err = 0.000168944
FM2_2_A1_sc =     1.09037; FM2_2_A1_sc_err =    0.130183
FM2_2_A1_bca =      251.63; FM2_2_A1_bca_err =     2.81242
FM2_2_A1_bcs =     20.0549; FM2_2_A1_bcs_err =     0.42296
FM1_2_A2_ac =      320.87; FM1_2_A2_ac_err =     7.05568
FM1_2_A2_ec =    0.102323; FM1_2_A2_ec_err = 0.000131558
FM1_2_A2_sc =    0.923409; FM1_2_A2_sc_err =    0.102492
FM1_2_A2_bca =     342.924; FM1_2_A2_bca_err =     3.17775
FM1_2_A2_bcs =     19.4824; FM1_2_A2_bcs_err =     0.30302
FM2_2_A2_ac =     214.138; FM2_2_A2_ac_err =      5.5322
FM2_2_A2_ec =    0.104992; FM2_2_A2_ec_err = 0.000142109
FM2_2_A2_sc =    0.697145; FM2_2_A2_sc_err =    0.109303
FM2_2_A2_bca =      241.96; FM2_2_A2_bca_err =     2.55195
FM2_2_A2_bcs =     19.4544; FM2_2_A2_bcs_err =     0.32276
FM1_2_A3_ac =     136.636; FM1_2_A3_ac_err =     4.75524
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FM1_2_A3_ec =    0.103871; FM1_2_A3_ec_err = 0.000233531
FM1_2_A3_sc =      1.1221; FM1_2_A3_sc_err =    0.179646
FM1_2_A3_bca =      154.19; FM1_2_A3_bca_err =     2.29539
FM1_2_A3_bcs =     17.2975; FM1_2_A3_bcs_err =    0.334139
FM2_2_A3_ac =      192.29; FM2_2_A3_ac_err =     5.41569
FM2_2_A3_ec =      0.1029; FM2_2_A3_ec_err = 0.000165792
FM2_2_A3_sc =     0.85831; FM2_2_A3_sc_err =     0.12895
FM2_2_A3_bca =     212.204; FM2_2_A3_bca_err =     2.48978
FM2_2_A3_bcs =      18.005; FM2_2_A3_bcs_err =    0.314231
FM1_2_A4_ac =     185.491; FM1_2_A4_ac_err =       5.8108
FM1_2_A4_ec =    0.103522; FM1_2_A4_ec_err = 0.000220546
FM1_2_A4_sc =     1.29976; FM1_2_A4_sc_err =    0.172101
FM1_2_A4_bca =      213.21; FM1_2_A4_bca_err =     2.73229
FM1_2_A4_bcs =     19.6313; FM1_2_A4_bcs_err =    0.386753
FM2_2_A4_ac =     244.171; FM2_2_A4_ac_err =     6.55793
FM2_2_A4_ec =    0.104411; FM2_2_A4_ec_err = 0.000175914
FM2_2_A4_sc =     1.05631; FM2_2_A4_sc_err =     0.13373
FM2_2_A4_bca =     296.887; FM2_2_A4_bca_err =     3.07504
FM2_2_A4_bcs =     20.5177; FM2_2_A4_bcs_err =    0.347387
FM1_4_A11H_ax =     54.2372; FM1_4_A11H_ax_err =     1.19012
FM1_4_A11H_ex =   0.0777103; FM1_4_A11H_ex_err = 8.48687e-05
FM1_4_A11H_sx =    0.264017; FM1_4_A11H_sx_err =   0.0056267
FM1_4_A11H_ba =     1457.53; FM1_4_A11H_ba_err =     12.4908
FM1_4_A11H_bs =      12.713; FM1_4_A11H_bs_err =    0.579507
FM2_1_A11H_ax =     11.4872; FM2_1_A11H_ax_err =    0.443261
FM2_1_A11H_ex =   0.0755959; FM2_1_A11H_ex_err = 0.000307648
FM2_1_A11H_sx =     0.52497; FM2_1_A11H_sx_err =   0.0257116
FM2_1_A11H_ba =     503.049; FM2_1_A11H_ba_err =     9.47156
FM2_1_A11H_bs =     14.9285; FM2_1_A11H_bs_err =     1.52819
FM1_1_A11H_ax =     26.1565; FM1_1_A11H_ax_err =    0.866959
FM1_1_A11H_ex =   0.0774111; FM1_1_A11H_ex_err =   0.0001354
FM1_1_A11H_sx =    0.277725; FM1_1_A11H_sx_err =  0.00909287
FM1_1_A11H_ba =     896.959; FM1_1_A11H_ba_err =     10.0747
FM1_1_A11H_bs =       30.64; FM1_1_A11H_bs_err =     4.29206
FM1_2_A11H_ax =     13.5874; FM1_2_A11H_ax_err =    0.586162
FM1_2_A11H_ex =   0.0777479; FM1_2_A11H_ex_err = 0.000169552
FM1_2_A11H_sx =    0.261805; FM1_2_A11H_sx_err =     0.01091
FM1_2_A11H_ba =      348.99; FM1_2_A11H_ba_err =     6.05638
FM1_2_A11H_bs =     9.43279; FM1_2_A11H_bs_err =    0.653675
FM1_3_A11H_ax =     12.0563; FM1_3_A11H_ax_err =    0.566331
FM1_3_A11H_ex =   0.0778498; FM1_3_A11H_ex_err = 0.000201575
FM1_3_A11H_sx =    0.295324; FM1_3_A11H_sx_err =   0.0136477
FM1_3_A11H_ba =     371.192; FM1_3_A11H_ba_err =     6.34236
FM1_3_A11H_bs =     14.1928; FM1_3_A11H_bs_err =      1.4146
FM2_2_A11H_ax =     8.08916; FM2_2_A11H_ax_err =    0.394119
FM2_2_A11H_ex =   0.0766584; FM2_2_A11H_ex_err = 0.000370213
FM2_2_A11H_sx =    0.500243; FM2_2_A11H_sx_err =   0.0303876
FM2_2_A11H_ba =     377.652; FM2_2_A11H_ba_err =     7.32351
FM2_2_A11H_bs =     9.18049; FM2_2_A11H_bs_err =    0.631357
FM1_4_A12H_ax =     107.765; FM1_4_A12H_ax_err =     1.26347
FM1_4_A12H_ex =    0.075955; FM1_4_A12H_ex_err = 0.00011318
FM1_4_A12H_sx =    0.607179; FM1_4_A12H_sx_err =    0.009777
FM1_4_A12H_ba =     5779.32; FM1_4_A12H_ba_err =     34.7239
FM1_4_A12H_bs =     11.8347; FM1_4_A12H_bs_err =     0.30093
FM2_1_A12H_ax =     45.2571; FM2_1_A12H_ax_err =    0.968573
FM2_1_A12H_ex =   0.0749065; FM2_1_A12H_ex_err = 0.00014688
FM2_1_A12H_sx =    0.463854; FM2_1_A12H_sx_err =   0.0119001
FM2_1_A12H_ba =     1980.37; FM2_1_A12H_ba_err =     17.6806
FM2_1_A12H_bs =     12.1211; FM2_1_A12H_bs_err =    0.495057
FM1_1_A12H_ax =     55.7888; FM1_1_A12H_ax_err =     1.02765
FM1_1_A12H_ex =    0.075732; FM1_1_A12H_ex_err = 0.000159282
FM1_1_A12H_sx =    0.558272; FM1_1_A12H_sx_err =   0.0137605
FM1_1_A12H_ba =     3556.72; FM1_1_A12H_ba_err =     26.4939
FM1_1_A12H_bs =     23.7585; FM1_1_A12H_bs_err =     1.49901
FM1_2_A12H_ax =     27.7262; FM1_2_A12H_ax_err =    0.664651
FM1_2_A12H_ex =   0.0763098; FM1_2_A12H_ex_err = 0.000210346
FM1_2_A12H_sx =    0.567169; FM1_2_A12H_sx_err =   0.0178072
FM1_2_A12H_ba =     1353.21; FM1_2_A12H_ba_err =     15.3075
FM1_2_A12H_bs =     10.1216; FM1_2_A12H_bs_err =    0.428683
FM1_3_A12H_ax =     21.5914; FM1_3_A12H_ax_err =    0.602025
FM1_3_A12H_ex =   0.0764491; FM1_3_A12H_ex_err = 0.000276135
FM1_3_A12H_sx =    0.616176; FM1_3_A12H_sx_err =   0.0238746
FM1_3_A12H_ba =      1479.5; FM1_3_A12H_ba_err =     16.7205
FM1_3_A12H_bs =     10.0137; FM1_3_A12H_bs_err =    0.412262
FM2_2_A12H_ax =     27.2528; FM2_2_A12H_ax_err =    0.753028
FM2_2_A12H_ex =   0.0746736; FM2_2_A12H_ex_err = 0.000208789
FM2_2_A12H_sx =    0.500447; FM2_2_A12H_sx_err =   0.0174415
FM2_2_A12H_ba =     1487.04; FM2_2_A12H_ba_err =     15.7208
FM2_2_A12H_bs =         9.8; FM2_2_A12H_bs_err =    0.381394
FM1_3_A21H_ax =     55.5401; FM1_3_A21H_ax_err =     1.32258
FM1_3_A21H_ex =   0.0779689; FM1_3_A21H_ex_err = 7.75355e-05
FM1_3_A21H_sx =    0.217502; FM1_3_A21H_sx_err = 0.00496723
FM1_3_A21H_ba =     1786.84; FM1_3_A21H_ba_err =     13.8036
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FM1_3_A21H_bs =      31.107; FM1_3_A21H_bs_err =     3.12781
FM2_1_A21H_ax =     16.1385; FM2_1_A21H_ax_err =    0.636229
FM2_1_A21H_ex =   0.0688094; FM2_1_A21H_ex_err = 0.000234953
FM2_1_A21H_sx =    0.402676; FM2_1_A21H_sx_err =   0.0194049
FM2_1_A21H_ba =     716.981; FM2_1_A21H_ba_err =      13.3226
FM2_1_A21H_bs =     8.49135; FM2_1_A21H_bs_err =    0.478419
FM1_1_A21H_ax =     24.0344; FM1_1_A21H_ax_err =    0.835636
FM1_1_A21H_ex =   0.0780096; FM1_1_A21H_ex_err = 0.000122208
FM1_1_A21H_sx =    0.238122; FM1_1_A21H_sx_err = 0.00798559
FM1_1_A21H_ba =      727.45; FM1_1_A21H_ba_err =     8.63039
FM1_1_A21H_bs =     13.3773; FM1_1_A21H_bs_err =    0.883098
FM1_2_A21H_ax =     12.9202; FM1_2_A21H_ax_err =    0.583298
FM1_2_A21H_ex =   0.0781783; FM1_2_A21H_ex_err = 0.000172999
FM1_2_A21H_sx =    0.260572; FM1_2_A21H_sx_err =    0.011434
FM1_2_A21H_ba =     352.971; FM1_2_A21H_ba_err =     5.97816
FM1_2_A21H_bs =     8.90059; FM1_2_A21H_bs_err =    0.568963
FM1_4_A21H_ax =     9.40425; FM1_4_A21H_ax_err =    0.512605
FM1_4_A21H_ex =   0.0781329; FM1_4_A21H_ex_err = 0.000228641
FM1_4_A21H_sx =    0.277318; FM1_4_A21H_sx_err =   0.0146718
FM1_4_A21H_ba =     316.184; FM1_4_A21H_ba_err =     5.75789
FM1_4_A21H_bs =      11.843; FM1_4_A21H_bs_err =     1.05952
FM2_2_A21H_ax =     8.82723; FM2_2_A21H_ax_err =    0.449789
FM2_2_A21H_ex =   0.0694903; FM2_2_A21H_ex_err = 0.000335531
FM2_2_A21H_sx =    0.435806; FM2_2_A21H_sx_err =   0.0283404
FM2_2_A21H_ba =      412.02; FM2_2_A21H_ba_err =     10.0862
FM2_2_A21H_bs =     7.24454; FM2_2_A21H_bs_err =    0.464313
FM1_3_A22H_ax =     116.052; FM1_3_A22H_ax_err =     1.81642
FM1_3_A22H_ex =   0.0744886; FM1_3_A22H_ex_err = 9.77351e-05
FM1_3_A22H_sx =    0.414977; FM1_3_A22H_sx_err = 0.00762986
FM1_3_A22H_ba =     7220.71; FM1_3_A22H_ba_err =     33.1031
FM1_3_A22H_bs =     22.7701; FM1_3_A22H_bs_err =    0.904248
FM2_1_A22H_ax =     66.0031; FM2_1_A22H_ax_err =     1.29806
FM2_1_A22H_ex =   0.0754708; FM2_1_A22H_ex_err = 0.000102426
FM2_1_A22H_sx =    0.348914; FM2_1_A22H_sx_err = 0.00726821
FM2_1_A22H_ba =     2456.58; FM2_1_A22H_ba_err =     17.4141
FM2_1_A22H_bs =     9.99253; FM2_1_A22H_bs_err =     0.28608
FM1_1_A22H_ax =     60.6985; FM1_1_A22H_ax_err =     1.27314
FM1_1_A22H_ex =   0.0751163; FM1_1_A22H_ex_err = 0.000120352
FM1_1_A22H_sx =    0.381563; FM1_1_A22H_sx_err = 0.00890132
FM1_1_A22H_ba =     2887.67; FM1_1_A22H_ba_err =      19.469
FM1_1_A22H_bs =     12.2332; FM1_1_A22H_bs_err =    0.398155
FM1_2_A22H_ax =     31.2522; FM1_2_A22H_ax_err =    0.870169
FM1_2_A22H_ex =   0.0753554; FM1_2_A22H_ex_err = 0.000170044
FM1_2_A22H_sx =    0.406295; FM1_2_A22H_sx_err =   0.0128645
FM1_2_A22H_ba =     1384.45; FM1_2_A22H_ba_err =     13.3431
FM1_2_A22H_bs =      8.2025; FM1_2_A22H_bs_err =    0.261123
FM1_4_A22H_ax =     20.5358; FM1_4_A22H_ax_err =    0.739811
FM1_4_A22H_ex =   0.0757747; FM1_4_A22H_ex_err = 0.000237122
FM1_4_A22H_sx =    0.436592; FM1_4_A22H_sx_err =   0.0186863
FM1_4_A22H_ba =     1241.59; FM1_4_A22H_ba_err =     12.7331
FM1_4_A22H_bs =     9.51187; FM1_4_A22H_bs_err =    0.366863
FM2_2_A22H_ax =     38.0927; FM2_2_A22H_ax_err =     1.00065
FM2_2_A22H_ex =   0.0758938; FM2_2_A22H_ex_err = 0.000132011
FM2_2_A22H_sx =    0.333088; FM2_2_A22H_sx_err = 0.00912741
FM2_2_A22H_ba =     1414.04; FM2_2_A22H_ba_err =     12.7811
FM2_2_A22H_bs =     7.82375; FM2_2_A22H_bs_err =    0.229331
FM1_4_B11H_ax =     49.6793; FM1_4_B11H_ax_err =      1.0436
FM1_4_B11H_ex =   0.0790206; FM1_4_B11H_ex_err = 0.00010448
FM1_4_B11H_sx =    0.337484; FM1_4_B11H_sx_err =  0.0071488
FM1_4_B11H_ba =      1298.6; FM1_4_B11H_ba_err =     11.8942
FM1_4_B11H_bs =     18.3239; FM1_4_B11H_bs_err =     1.25833
FM2_2_B11H_ax =     2.80828; FM2_2_B11H_ax_err =    0.333841
FM2_2_B11H_ex =   0.0758577; FM2_2_B11H_ex_err = 0.000838733
FM2_2_B11H_sx =    0.457346; FM2_2_B11H_sx_err =  0.0677426
FM2_2_B11H_ba =     341.308; FM2_2_B11H_ba_err =     6.69737
FM2_2_B11H_bs =     11.2076; FM2_2_B11H_bs_err =    0.960097
FM1_2_B11H_ax =     4.42966; FM1_2_B11H_ax_err =    0.340959
FM1_2_B11H_ex =   0.0786358; FM1_2_B11H_ex_err = 0.000528819
FM1_2_B11H_sx =    0.470603; FM1_2_B11H_sx_err =  0.0435856
FM1_2_B11H_ba =     284.719; FM1_2_B11H_ba_err =      5.7528
FM1_2_B11H_bs =     11.6863; FM1_2_B11H_bs_err =     1.10259
FM1_4_B12H_ax =      142.94; FM1_4_B12H_ax_err =     1.75494
FM1_4_B12H_ex =   0.0787504; FM1_4_B12H_ex_err = 7.36201e-05
FM1_4_B12H_sx =    0.411498; FM1_4_B12H_sx_err = 0.00558656
FM1_4_B12H_ba =     4918.23; FM1_4_B12H_ba_err =     23.8727
FM1_4_B12H_bs =     17.7635; FM1_4_B12H_bs_err =    0.618014
FM2_2_B12H_ax =     16.5176; FM2_2_B12H_ax_err =    0.709567
FM2_2_B12H_ex =   0.0724556; FM2_2_B12H_ex_err = 0.000287377
FM2_2_B12H_sx =    0.440304; FM2_2_B12H_sx_err =  0.0235683
FM2_2_B12H_ba =     1279.15; FM2_2_B12H_ba_err =     15.0543
FM2_2_B12H_bs =     11.8035; FM2_2_B12H_bs_err =    0.610914
FM1_2_B12H_ax =     17.4046; FM1_2_B12H_ax_err =    0.744006
FM1_2_B12H_ex =    0.078622; FM1_2_B12H_ex_err = 0.000236905
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FM1_2_B12H_sx =   0.367949; FM1_2_B12H_sx_err =  0.0172171
FM1_2_B12H_ba =    1080.03; FM1_2_B12H_ba_err =    10.5704
FM1_2_B12H_bs =    13.9075; FM1_2_B12H_bs_err =   0.779916
FM1_3_B21H_ax =    71.7946; FM1_3_B21H_ax_err =    1.31766
FM1_3_B21H_ex =  0.0786295; FM1_3_B21H_ex_err = 8.32814e-05
FM1_3_B21H_sx =   0.303157; FM1_3_B21H_sx_err = 0.00549287
FM1_3_B21H_ba =    2084.48; FM1_3_B21H_ba_err =    14.9438
FM1_3_B21H_bs =    18.8155; FM1_3_B21H_bs_err =    1.04794
FM2_2_B21H_ax =    2.92449; FM2_2_B21H_ax_err =   0.412351
FM2_2_B21H_ex =  0.0657276; FM2_2_B21H_ex_err = 0.000581335
FM2_2_B21H_sx =   0.263887; FM2_2_B21H_sx_err =  0.0391702
FM2_2_B21H_ba =    281.997; FM2_2_B21H_ba_err =    7.84858
FM2_2_B21H_bs =    10.7252; FM2_2_B21H_bs_err =     1.1292
FM1_3_B22H_ax =    215.619; FM1_3_B22H_ax_err =    2.30755
FM1_3_B22H_ex =  0.0760144; FM1_3_B22H_ex_err = 5.90439e-05
FM1_3_B22H_sx =   0.370977; FM1_3_B22H_sx_err = 0.00430335
FM1_3_B22H_ba =    8212.42; FM1_3_B22H_ba_err =     32.301
FM1_3_B22H_bs =    14.0878; FM1_3_B22H_bs_err =   0.310253
FM2_2_B22H_ax =    7.96648; FM2_2_B22H_ax_err =    0.83486
FM2_2_B22H_ex =  0.0615186; FM2_2_B22H_ex_err = 0.00080994
FM2_2_B22H_sx =   0.973623; FM2_2_B22H_sx_err =  0.0999323
FM2_2_B22H_ba =    855.532; FM2_2_B22H_ba_err =    59.8953
FM2_2_B22H_bs =    52.8514; FM2_2_B22H_bs_err =     48.353
FM1_2_A11H_ac =    25.9807; FM1_2_A11H_ac_err =    3.46561
FM1_2_A11H_ec =  0.0775672; FM1_2_A11H_ec_err = 0.000484949
FM1_2_A11H_sc =    0.80228; FM1_2_A11H_sc_err =   0.386524
FM1_2_A11H_bca =    31.3508; FM1_2_A11H_bca_err =    1.37141
FM1_2_A11H_bcs =    13.0202; FM1_2_A11H_bcs_err =    1.37876
FM2_2_A11H_ac =    27.2156; FM2_2_A11H_ac_err =    4.43754
FM2_2_A11H_ec =  0.0770757; FM2_2_A11H_ec_err = 0.00069357
FM2_2_A11H_sc =    1.36068; FM2_2_A11H_sc_err =   0.542342
FM2_2_A11H_bca =    33.8368; FM2_2_A11H_bca_err =    1.80581
FM2_2_A11H_bcs =    12.4069; FM2_2_A11H_bcs_err =     1.4151
FM1_1_A11H_ac =    41.418; FM1_1_A11H_ac_err =    7111.29
FM1_1_A11H_ec =  0.0778051; FM1_1_A11H_ec_err =    5.21748
FM1_1_A11H_sc =  0.0769778; FM1_1_A11H_sc_err =    6349.32
FM1_1_A11H_bca =    142.756; FM1_1_A11H_bca_err =    24505.7
FM1_1_A11H_bcs =    11.9696; FM1_1_A11H_bcs_err =   0.501251
FM1_3_A11H_ac =    19.8692; FM1_3_A11H_ac_err =    3.07051
FM1_3_A11H_ec =  0.0773052; FM1_3_A11H_ec_err = 0.000468547
FM1_3_A11H_sc =   0.495732; FM1_3_A11H_sc_err =   0.386437
FM1_3_A11H_bca =    30.6267; FM1_3_A11H_bca_err =    1.2434
FM1_3_A11H_bcs =    11.4338; FM1_3_A11H_bcs_err =    1.01676
FM1_4_A11H_ac =    115.124; FM1_4_A11H_ac_err =    11.8669
FM1_4_A11H_ec =  0.0783267; FM1_4_A11H_ec_err = 0.000431339
FM1_4_A11H_sc =    1.40873; FM1_4_A11H_sc_err =   0.361097
FM1_4_A11H_bca =    251.721; FM1_4_A11H_bca_err =    5.12966
FM1_4_A11H_bcs =    15.2864; FM1_4_A11H_bcs_err =   0.794485
FM2_1_A11H_ac =    31.2021; FM2_1_A11H_ac_err =    3.96905
FM2_1_A11H_ec =  0.0760284; FM2_1_A11H_ec_err = 0.000369996
FM2_1_A11H_sc =    0.49783; FM2_1_A11H_sc_err =   0.299429
FM2_1_A11H_bca =    47.7816; FM2_1_A11H_bca_err =    1.52746
FM2_1_A11H_bcs =    11.2103; FM2_1_A11H_bcs_err =   0.83769
FM1_2_A12H_ac =    78.4922; FM1_2_A12H_ac_err =    9.89131
FM1_2_A12H_ec =  0.0779964; FM1_2_A12H_ec_err = 0.000567137
FM1_2_A12H_sc =     1.8712; FM1_2_A12H_sc_err =   0.465228
FM1_2_A12H_bca =    126.655; FM1_2_A12H_bca_err =    4.40528
FM1_2_A12H_bcs =    11.8672; FM1_2_A12H_bcs_err =   0.722392
FM2_2_A12H_ac =    88.8245; FM2_2_A12H_ac_err =    7.51172
FM2_2_A12H_ec =  0.0764141; FM2_2_A12H_ec_err = 0.000308896
FM2_2_A12H_sc =   0.913663; FM2_2_A12H_sc_err =   0.252375
FM2_2_A12H_bca =    132.436; FM2_2_A12H_bca_err =    3.02157
FM2_2_A12H_bcs =    11.7062; FM2_2_A12H_bcs_err =   0.589054
FM1_1_A12H_ac =    142.345; FM1_1_A12H_ac_err =    24031.9
FM1_1_A12H_ec =  0.0778607; FM1_1_A12H_ec_err =    4.96204
FM1_1_A12H_sc =  0.0769778; FM1_1_A12H_sc_err =    27102.2
FM1_1_A12H_bca =    558.415; FM1_1_A12H_bca_err =    94262.9
FM1_1_A12H_bcs =    11.5767; FM1_1_A12H_bcs_err =   0.236566
FM1_3_A12H_ac =    84.9981; FM1_3_A12H_ac_err =    13.0393
FM1_3_A12H_ec =  0.0773754; FM1_3_A12H_ec_err = 0.000694121
FM1_3_A12H_sc =    2.53914; FM1_3_A12H_sc_err =   0.566484
FM1_3_A12H_bca =    120.152; FM1_3_A12H_bca_err =    5.35696
FM1_3_A12H_bcs =    11.7579; FM1_3_A12H_bcs_err =   0.915953
FM1_4_A12H_ac =    420.274; FM1_4_A12H_ac_err =    28.2626
FM1_4_A12H_ec =  0.0785779; FM1_4_A12H_ec_err = 0.000295951
FM1_4_A12H_sc =    1.92075; FM1_4_A12H_sc_err =   0.250025
FM1_4_A12H_bca =    986.665; FM1_4_A12H_bca_err =    12.9198
FM1_4_A12H_bcs =    14.7918; FM1_4_A12H_bcs_err =    0.42484
FM2_1_A12H_ac =    101.431; FM2_1_A12H_ac_err =    10.4715
FM2_1_A12H_ec =  0.0768109; FM2_1_A12H_ec_err = 0.000432256
FM2_1_A12H_sc =    1.48837; FM2_1_A12H_sc_err =   0.358067
FM2_1_A12H_bca =    180.093; FM2_1_A12H_bca_err =    5.07658
FM2_1_A12H_bcs =    9.90748; FM2_1_A12H_bcs_err =   0.397106
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FM1_1_A21H_ac =     33.9483; FM1_1_A21H_ac_err =     3540.89
FM1_1_A21H_ec =   0.0777891; FM1_1_A21H_ec_err =     2.79237
FM1_1_A21H_sc =   0.0769778; FM1_1_A21H_sc_err =     2855.64
FM1_1_A21H_bca =     77.5755; FM1_1_A21H_bca_err =     8088.71
FM1_1_A21H_bcs =     10.5487; FM1_1_A21H_bcs_err =    0.506436
FM2_2_A21H_ac =     20.3915; FM2_2_A21H_ac_err =     2.99026
FM2_2_A21H_ec =   0.0729003; FM2_2_A21H_ec_err = 0.000342547
FM2_2_A21H_sc =    0.183298; FM2_2_A21H_sc_err =    0.209267
FM2_2_A21H_bca =     28.0466; FM2_2_A21H_bca_err =     1.06966
FM2_2_A21H_bcs =     9.69668; FM2_2_A21H_bcs_err =    0.893096
FM1_2_A21H_ac =     20.7275; FM1_2_A21H_ac_err =     4.45747
FM1_2_A21H_ec =   0.0784309; FM1_2_A21H_ec_err = 0.00102579
FM1_2_A21H_sc =     1.86156; FM1_2_A21H_sc_err =    0.847046
FM1_2_A21H_bca =      27.474; FM1_2_A21H_bca_err =     1.94697
FM1_2_A21H_bcs =     12.1644; FM1_2_A21H_bcs_err =     1.52564
FM1_3_A21H_ac =     138.668; FM1_3_A21H_ac_err =     20.7621
FM1_3_A21H_ec =   0.0776542; FM1_3_A21H_ec_err = 0.000609343
FM1_3_A21H_sc =     2.22475; FM1_3_A21H_sc_err =    0.550248
FM1_3_A21H_bca =     367.937; FM1_3_A21H_bca_err =     8.71455
FM1_3_A21H_bcs =     16.1921; FM1_3_A21H_bcs_err =      1.0107
FM1_4_A21H_ac =     18.6388; FM1_4_A21H_ac_err =     3.04983
FM1_4_A21H_ec =   0.0779313; FM1_4_A21H_ec_err = 0.000657196
FM1_4_A21H_sc =    0.979454; FM1_4_A21H_sc_err =    0.522571
FM1_4_A21H_bca =     22.6531; FM1_4_A21H_bca_err =     1.28374
FM1_4_A21H_bcs =     12.0716; FM1_4_A21H_bcs_err =     1.39306
FM1_1_A22H_ac =     116.832; FM1_1_A22H_ac_err =     19965.4
FM1_1_A22H_ec =   0.0778577; FM1_1_A22H_ec_err =     4.41987
FM1_1_A22H_sc =   0.0769778; FM1_1_A22H_sc_err =     20009.5
FM1_1_A22H_bca =     286.313; FM1_1_A22H_bca_err =     48921.9
FM1_1_A22H_bcs =     10.1891; FM1_1_A22H_bcs_err =    0.242063
FM2_1_A22H_ac =     127.063; FM2_1_A22H_ac_err =     10.2087
FM2_1_A22H_ec =   0.0761413; FM2_1_A22H_ec_err = 0.000299768
FM2_1_A22H_sc =     1.01054; FM2_1_A22H_sc_err =    0.243512
FM2_1_A22H_bca =     227.775; FM2_1_A22H_bca_err =     4.54826
FM2_1_A22H_bcs =     10.3754; FM2_1_A22H_bcs_err =    0.364013
FM1_2_A22H_ac =     88.3852; FM1_2_A22H_ac_err =     8.87535
FM1_2_A22H_ec =   0.0771598; FM1_2_A22H_ec_err = 0.000439504
FM1_2_A22H_sc =     1.65624; FM1_2_A22H_sc_err =    0.353131
FM1_2_A22H_bca =     112.566; FM1_2_A22H_bca_err =     3.51994
FM1_2_A22H_bcs =     13.1605; FM1_2_A22H_bcs_err =    0.935779
FM1_3_A22H_ac =     415.979; FM1_3_A22H_ac_err =     38.3478
FM1_3_A22H_ec =   0.0779233; FM1_3_A22H_ec_err = 0.000382036
FM1_3_A22H_sc =     2.22363; FM1_3_A22H_sc_err =    0.345795
FM1_3_A22H_bca =     1332.27; FM1_3_A22H_bca_err =     19.9222
FM1_3_A22H_bcs =     14.1461; FM1_3_A22H_bcs_err =    0.389629
FM1_4_A22H_ac =     64.2549; FM1_4_A22H_ac_err =     7.44352
FM1_4_A22H_ec =   0.0763114; FM1_4_A22H_ec_err = 0.000468856
FM1_4_A22H_sc =     1.35798; FM1_4_A22H_sc_err =    0.383128
FM1_4_A22H_bca =     94.0921; FM1_4_A22H_bca_err =     3.07039
FM1_4_A22H_bcs =     11.4768; FM1_4_A22H_bcs_err =    0.753186
FM2_2_A22H_ac =     73.4678; FM2_2_A22H_ac_err =     7.31646
FM2_2_A22H_ec =   0.0766434; FM2_2_A22H_ec_err = 0.000382685
FM2_2_A22H_sc =     1.08104; FM2_2_A22H_sc_err =    0.313061
FM2_2_A22H_bca =     113.929; FM2_2_A22H_bca_err =     3.11461
FM2_2_A22H_bcs =     10.9215; FM2_2_A22H_bcs_err =    0.564448
FM1_1_B11H_ac =     60.6045; FM1_1_B11H_ac_err =      4907.5
FM1_1_B11H_ec =   0.0793575; FM1_1_B11H_ec_err =     2.87186
FM1_1_B11H_sc =   0.0769778; FM1_1_B11H_sc_err =     3164.48
FM1_1_B11H_bca =     142.734; FM1_1_B11H_bca_err =     11554.8
FM1_1_B11H_bcs =     13.9688; FM1_1_B11H_bcs_err =    0.637399
FM2_1_B11H_ac =     35.8532; FM2_1_B11H_ac_err =     3.74139
FM2_1_B11H_ec =    0.078655; FM2_1_B11H_ec_err = 0.000103696
FM2_1_B11H_sc =    0.102389; FM2_1_B11H_sc_err =     69.8462
FM2_1_B11H_bca =     55.5005; FM2_1_B11H_bca_err =     1.30785
FM2_1_B11H_bcs =     12.9207; FM2_1_B11H_bcs_err =    0.865956
FM1_2_B11H_ac =     25.2843; FM1_2_B11H_ac_err =     3.04188
FM1_2_B11H_ec =   0.0796694; FM1_2_B11H_ec_err = 0.000398198
FM1_2_B11H_sc =    0.533639; FM1_2_B11H_sc_err =    0.319274
FM1_2_B11H_bca =     32.5241; FM1_2_B11H_bca_err =     1.26039
FM1_2_B11H_bcs =     13.3397; FM1_2_B11H_bcs_err =     1.19288
FM1_3_B11H_ac =     18.5804; FM1_3_B11H_ac_err =     5.03299
FM1_3_B11H_ec =   0.0800336; FM1_3_B11H_ec_err = 0.00138304
FM1_3_B11H_sc =     2.21955; FM1_3_B11H_sc_err =     1.10372
FM1_3_B11H_bca =     29.5988; FM1_3_B11H_bca_err =     2.40023
FM1_3_B11H_bcs =     12.5201; FM1_3_B11H_bcs_err =     1.58199
FM1_4_B11H_ac =     135.223; FM1_4_B11H_ac_err =     20.4419
FM1_4_B11H_ec =   0.0811793; FM1_4_B11H_ec_err = 0.000780112
FM1_4_B11H_sc =     3.03428; FM1_4_B11H_sc_err =    0.659924
FM1_4_B11H_bca =     272.291; FM1_4_B11H_bca_err =     9.14206
FM1_4_B11H_bcs =     16.4765; FM1_4_B11H_bcs_err =     1.12767
FM2_2_B11H_ac =     33.8454; FM2_2_B11H_ac_err =      4.3317
FM2_2_B11H_ec =    0.079318; FM2_2_B11H_ec_err = 0.000581184
FM2_2_B11H_sc =     1.37403; FM2_2_B11H_sc_err =    0.461552
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FM2_2_B11H_bca =     37.4729; FM2_2_B11H_bca_err =     1.77266
FM2_2_B11H_bcs =     14.8049; FM2_2_B11H_bcs_err =     1.67488
FM1_1_B12H_ac =     213.902; FM1_1_B12H_ac_err =     10281.2
FM1_1_B12H_ec =   0.0793608; FM1_1_B12H_ec_err =     1.58777
FM1_1_B12H_sc =   0.0769778; FM1_1_B12H_sc_err =     1814.47
FM1_1_B12H_bca =     540.572; FM1_1_B12H_bca_err =     25975.5
FM1_1_B12H_bcs =      13.012; FM1_1_B12H_bcs_err =     0.27866
FM2_1_B12H_ac =     107.277; FM2_1_B12H_ac_err =     46.1373
FM2_1_B12H_ec =   0.0778345; FM2_1_B12H_ec_err =   0.0111363
FM2_1_B12H_sc =    0.102389; FM2_1_B12H_sc_err =     29.0669
FM2_1_B12H_bca =     215.022; FM2_1_B12H_bca_err =     87.5021
FM2_1_B12H_bcs =     10.8482; FM2_1_B12H_bcs_err =    0.317776
FM1_2_B12H_ac =      86.989; FM1_2_B12H_ac_err =     6.29337
FM1_2_B12H_ec =   0.0783273; FM1_2_B12H_ec_err =  0.000229269
FM1_2_B12H_sc =    0.534191; FM1_2_B12H_sc_err =    0.179815
FM1_2_B12H_bca =     131.331; FM1_2_B12H_bca_err =     2.49892
FM1_2_B12H_bcs =     13.2866; FM1_2_B12H_bcs_err =    0.642797
FM1_3_B12H_ac =     53.7528; FM1_3_B12H_ac_err =     8.71915
FM1_3_B12H_ec =   0.0789628; FM1_3_B12H_ec_err =  0.000738339
FM1_3_B12H_sc =      1.7176; FM1_3_B12H_sc_err =     0.61979
FM1_3_B12H_bca =      119.97; FM1_3_B12H_bca_err =     4.76408
FM1_3_B12H_bcs =     11.2785; FM1_3_B12H_bcs_err =    0.610223
FM1_4_B12H_ac =     601.011; FM1_4_B12H_ac_err =     56.5718
FM1_4_B12H_ec =   0.0791846; FM1_4_B12H_ec_err =  0.000423352
FM1_4_B12H_sc =     3.51838; FM1_4_B12H_sc_err =    0.372852
FM1_4_B12H_bca =     1043.38; FM1_4_B12H_bca_err =     19.8247
FM1_4_B12H_bcs =     17.3963; FM1_4_B12H_bcs_err =    0.911671
FM2_2_B12H_ac =     107.495; FM2_2_B12H_ac_err =     8.46729
FM2_2_B12H_ec =   0.0760442; FM2_2_B12H_ec_err =  0.000283994
FM2_2_B12H_sc =    0.975956; FM2_2_B12H_sc_err =    0.231678
FM2_2_B12H_bca =     152.172; FM2_2_B12H_bca_err =     3.17184
FM2_2_B12H_bcs =     13.2086; FM2_2_B12H_bcs_err =    0.749795
FM1_1_B21H_ac =     43.4491; FM1_1_B21H_ac_err =     833.547
FM1_1_B21H_ec =   0.0792992; FM1_1_B21H_ec_err =    0.641035
FM1_1_B21H_sc =   0.0769778; FM1_1_B21H_sc_err =     458.522
FM1_1_B21H_bca =       95.51; FM1_1_B21H_bca_err =     1829.71
FM1_1_B21H_bcs =     13.1791; FM1_1_B21H_bcs_err =    0.676735
FM2_1_B21H_ac =     53.7401; FM2_1_B21H_ac_err =     12.7813
FM2_1_B21H_ec =   0.0778925; FM2_1_B21H_ec_err =  0.00908982
FM2_1_B21H_sc =    0.102389; FM2_1_B21H_sc_err =     49.3767
FM2_1_B21H_bca =     80.3804; FM2_1_B21H_bca_err =     19.6204
FM2_1_B21H_bcs =     14.6561; FM2_1_B21H_bcs_err =    0.967919
FM1_2_B21H_ac =     17.1617; FM1_2_B21H_ac_err =     2.74333
FM1_2_B21H_ec =   0.0796425; FM1_2_B21H_ec_err =  0.000425797
FM1_2_B21H_sc =    0.330189; FM1_2_B21H_sc_err =    0.331847
FM1_2_B21H_bca =     28.8286; FM1_2_B21H_bca_err =     1.08781
FM1_2_B21H_bcs =     15.4571; FM1_2_B21H_bcs_err =     1.75493
FM1_4_B21H_ac =     62.5802; FM1_4_B21H_ac_err =     238.722
FM1_4_B21H_ec =   0.0763696; FM1_4_B21H_ec_err =   0.0688624
FM1_4_B21H_sc =     10.2677; FM1_4_B21H_sc_err =     14.8411
FM1_4_B21H_bca =     29.8506; FM1_4_B21H_bca_err =     106.712
FM1_4_B21H_bcs =     56.5197; FM1_4_B21H_bcs_err =     730.189
FM2_2_B21H_ac =     20.4795; FM2_2_B21H_ac_err =     5.39965
FM2_2_B21H_ec =   0.0802742; FM2_2_B21H_ec_err =  0.00140488
FM2_2_B21H_sc =     2.57484; FM2_2_B21H_sc_err =     1.11559
FM2_2_B21H_bca =     27.4168; FM2_2_B21H_bca_err =     2.34919
FM2_2_B21H_bcs =      13.877; FM2_2_B21H_bcs_err =     2.14822
FM1_1_B22H_ac =     146.122; FM1_1_B22H_ac_err =     1197.65
FM1_1_B22H_ec =   0.0792864; FM1_1_B22H_ec_err =    0.252527
FM1_1_B22H_sc =   0.0769778; FM1_1_B22H_sc_err =     169.944
FM1_1_B22H_bca =     360.508; FM1_1_B22H_bca_err =     2949.04
FM1_1_B22H_bcs =     12.1602; FM1_1_B22H_bcs_err =    0.294434
FM2_1_B22H_ac =     179.594; FM2_1_B22H_ac_err =     36.7173
FM2_1_B22H_ec =   0.0777824; FM2_1_B22H_ec_err =  0.00578343
FM2_1_B22H_sc =    0.102391; FM2_1_B22H_sc_err =     6.96505
FM2_1_B22H_bca =     294.618; FM2_1_B22H_bca_err =     55.1161
FM2_1_B22H_bcs =     12.3674; FM2_1_B22H_bcs_err =     0.36086
FM1_2_B22H_ac =     68.4403; FM1_2_B22H_ac_err =     6.00061
FM1_2_B22H_ec =   0.0777219; FM1_2_B22H_ec_err =  0.000282278
FM1_2_B22H_sc =    0.582671; FM1_2_B22H_sc_err =      0.2245
FM1_2_B22H_bca =     112.072; FM1_2_B22H_bca_err =     2.34304
FM1_2_B22H_bcs =     13.6759; FM1_2_B22H_bcs_err =    0.774518
FM1_3_B22H_ac =    -1410.36; FM1_3_B22H_ac_err =      159.81
FM1_3_B22H_ec =   0.0608581; FM1_3_B22H_ec_err =  0.000528529
FM1_3_B22H_sc =     3.67533; FM1_3_B22H_sc_err =    0.473388
FM1_3_B22H_bca =     3537.63; FM1_3_B22H_bca_err =      45.206
FM1_3_B22H_bcs =     9.82178; FM1_3_B22H_bcs_err =    0.186265
FM1_4_B22H_ac =     284.882; FM1_4_B22H_ac_err =     1539.42
FM1_4_B22H_ec =    0.066826; FM1_4_B22H_ec_err =   0.0890862
FM1_4_B22H_sc =      9.9411; FM1_4_B22H_sc_err =     14.7801
FM1_4_B22H_bca =     167.498; FM1_4_B22H_bca_err =     629.071
FM1_4_B22H_bcs =     92.6079; FM1_4_B22H_bcs_err =     2893.36
FM2_2_B22H_ac =     64.1181; FM2_2_B22H_ac_err =     7.42982
```

```
742  FM2_2_B22H_ec =  0.0783992; FM2_2_B22H_ec_err = 0.000502476
743  FM2_2_B22H_sc =    1.34573; FM2_2_B22H_sc_err =   0.408335
744  FM2_2_B22H_bca =     110.66; FM2_2_B22H_bca_err =    3.47454
745  FM2_2_B22H_bcs =    11.6709; FM2_2_B22H_bcs_err =   0.633119
```

3.7 FM1 Script

```
#! /usr/local/bin/gnuplot
# -*- gnuplot -*-

# (replace-regexp "^\\([a-zA-Z_0-9]+\\)\\( *\\) = \\([0-9.e+-]+ *\\)      \\+/- \\([0-9.e+-]+ *\\) (.*)$" "\\1\\2 = \\3 ; \\1_err\\2 = \\4" nil (if (and transient-mark-mode mark-active) (region-beginning)) (if (and transient-mark-mode mark-active) (region-end)) nil)

# (replace-regexp "^\\( *if (\\)1\\+\\(plot_all\\|fit_all\\)" "\\1\\2" nil (if (and transient-mark-mode mark-active) (region-end)) nil)

# Paste gnuplot fit "Final set of parameters" into this file.
# In Emacs, place cursor in the empty line above and type: C-x C-e.

reset
unset print

fn_base = "2016-10-05-fm1-tvcal"
set title fn_base."-calibration" noenh

fn_xrays(T) = "data/".fn_base."-x_".T."°C_xrays.hist"
fn_bb_c(T) = "data/".fn_base."-x_".T."°C_BB_C.1dhist"
fn_bb(T) = "data/".fn_base."-x_".T."°C.bb_itf"
fn_bgo(T) = "data/".fn_base."-x_".T."°C.BGO"
fn_abhl(T) = "data/".fn_base."-x_".T."°C.ABHL"

fit_all = 0
plot_all = fit_all
plot_pause = 0

fitlogfile = fn_base."-calibration.fit"
resultfile = fn_base."-calibration.results"

if (ARG1 eq "fit") {
  fit_all = 1
  plot_all = 1
  system("rm -f ".fitlogfile)
  if (ARG2 eq "pause") {
   plot_pause = -1
  }
  if (ARG2 eq "dumb") {
   set term dumb
  }
}

set fit logfile fitlogfile
set fit results

if (ARG1[1:4] eq "plot") {
  fit_all = 0
  plot_all = 1
  if (ARG1 eq "plotthis") {plot_all = 0}
  plot_pause = 0
  plotext = ARG2[strlen(ARG2)-2:]
  if (plotext eq "png") {
   set out ARG2
   set term png size 1200,900
  }
  if (plotext eq ".ps") {
   set out ARG2
   set term postscript enhanced solid color
  }
  if (plotext eq "pdf") {
   set out ARG2
   set term pdf size 11.6in,8.2in
   set lmargin at screen 0.075
   set rmargin at screen 0.925
   set tmargin at screen 0.075
   set bmargin at screen 0.90
  }
}
if (ARG1 eq "print") {
  fit_all = 0
  plot_all = 0
  set print ARG2
}
if (ARG1[1:5] eq "pause") {
  fit_all = 0
  plot_all = 1
```

```
76    if (ARG1 eq "pausethis") {plot_all = 0}
77    plot_pause = -1
78    if (ARG2 ne "") {
79     plot_pause = ARG2+0
80    }
81  }
82
83  load resultfile
84  if (fit_all) {
85    system("mv ".resultfile." ".resultfile."~")
86    set print resultfile
87    print "# `date`"
88    unset print
89  }
90
91  I=2
92  mV = 9.772
93
94  C4=I+22
95  A3=I+25
96  C3=I+24
97  A4=I+23
98  C2=I+26
99  A1=I+29
100 C1=I+28
101 A2=I+27
102
103 A11L=I+ 8
104 A11H=I+ 6
105 A12L=I+ 9
106 A12H=I+21
107
108 B11L=I+ 0
109 B11H=I+ 1
110 B12L=I+ 3
111 B12H=I+ 2
112 B13G=I+ 7
113
114 A21L=I+17
115 A21H=I+16
116 A22L=I+14
117 A22H=I+15
118
119 B21L=I+10
120 B21H=I+11
121 B22L=I+12
122 B22H=I+13
123 B23G=I+19
124
125 C1L=I+4
126 C1H=I+5
127 C2L=I+20
128 C2H=I+18
129
130 set samples 10000
131 set fit errorvar noerrorscaling
132
133 pk(a,e,s, x) = a*exp(-((x-e)/s)**2/2)
134 bg(a,e,s, x) = a*exp(-(x-e)/s)
135
136 keV75 = 74.969 # X-ray
137 keV73 = 72.805 # X-ray
138 keV84 = 84.45
139 keV85 = 84.938
140 keV87 = 87.3
141 keV58 = 57.962 # Comptom backscatter
142 keV57 = 56.660 # Comptom backscatter
143 keV393 = 393.306  # Comptom edge
144 keV858 = 857.6427 # Comptom edge
145 biX2(a,e,s, x) = pk(a*4.31,e*keV84,s, x) + pk(a*8.27,e*keV85,s, x)  + pk(a*3.02,e*keV87,
        s, x)
146 biB(a,e,s, ba,bs, x) = bg(ba,e*keV58,bs, x) + pk(a*35.7,e*keV58,s, x) + pk(a*23.7, e*
        keV57,s, x)
147 biX(a,e,s, ba,bs, x) = bg(ba,e*keV75,bs, x) + pk(a*35.7,e*keV75,s, x) + pk(a*23.7, e*
        keV73,s, x) + biX2(a*0.65,e,s, x)
148 biXB(a,e,s, ab,eb,sb, ba,bs, x) = biX(a,e,s, ba,bs, x) + biB(ab,eb,sb, 0,1, x)
149 CEdge(a,e,s, ba,bs, x) = bg(ba,e,bs, x)*(1+a/2/ba*erf(-(x-e)/s))
150 biC(a,e,s, ba,bs, x) = bg(ba,e*keV393,bs, x)*(1+a/2/ba*erf(-(x-e*keV393)/s))
151 biC2(a,e,s, ba,bs, x) = bg(ba,e*keV858,bs, x)*(1+a/2/ba*erf(-(x-e*keV858)/s))
152
153 keV482  = 481.6935 # conversion e-
154 keV554  = 553.8372 # conversion e-
155 keV566  = 565.8473 # conversion e-
```

```
156  keV976  = 975.651  # conversion e^-
157  keV1048 = 1047.795 # conversion e^-
158  keV1060 = 1059.805 # conversion e^-
159  CE(keV, e1,e2, x) = e2*keV - e2/e1*x
160  biE1(a,aa,e,s, ba,bs, x) = bg(ba,e*keV482,bs, x) + pk(a*1.537,e*keV482,s, x) + pk(aa*a
       *0.442, e*keV554, s, x) + pk(aa*a*0.111, e*keV566,s, x)
161  biE2(a,aa,e,s, ba,bs, x) = bg(ba,e*keV976,bs, x) + pk(a*7.08, e*keV976,s, x) + pk(aa*a
       *1.84,  e*keV1048,s, x) + pk(aa*a*0.44, e*keV1060,s, x)
162
163  landau(l)=sqrt(exp(-l-exp(-l))/2/pi)
164  mips(a,e,s, x)=a*landau((x-e)/s)
165  tail_e = 2.5
166  tail_s = 2.5
167  tail_N(w,s) = 2*s*exp((w/(2*s))**2) # integrate(exp(-x/s)*(1+erf(x/w)), x)
168  tail(a,e,w,s, x) = a/(2*s*exp((w/(2*s))**2))*(1+erf((x-e)/w))*exp(-(x-e)/s)
169  mips_tail(a,e,s, ta,ts, x)=mips(a,e,s, x) + tail(ta, e+tail_e*s, s*tail_s, ts, x)
170
171  keV_ABBA = 18.024*1000
172
173  TEMPS = "-17 -9 +6 19 30 41 46"
174  N = words(TEMPS)
175  array TEMP[N]
176  do for [i=1:N] { TEMP[i] = word(TEMPS, i); }
177  s = "ix(T) ="
178  do for [i=1:N] { s = s . sprintf(" T==TEMP[%d] ? %d :",i,i) }
179  s = s." 0"
180  eval s
181
182  array Temp[N]
183  do for [i=1:N] {
184    T=TEMP[i]
185    eval system(sprintf('awk "/%s°C/{print \"Temp[%d]=\" \$7;exit}" %s*.avg_temp', T, i,
         fn_base))
186  }
187
188  DEFAULTS = "set log y;unset log x;set x2tics;set xtics nomirror;set ytics nomirror;" \
189  . "set xlab 'pulse height [mV]';set x2lab 'pulse height [keV]';" \
190  . "set y2tics;unset format; set format y2 '%.0f°C'"
191  @DEFAULTS
192
193  array axI[N]
194  array exI[N]
195  array sxI[N]
196  array abI[N]
197  array baI[N]
198  array bsI[N]
199  array acI[N]
200  array ecI[N]
201  array scI[N]
202  array bcaI[N]
203  array bcsI[N]
204  array aI[N]
205  array eI[N]
206  array sI[N]
207  array eI_err[N]
208  array ee0[30]
209  array ee1[30]
210  array ee2[30]
211
212
213  # EPT X-rays  ##########################################################
214
215  ax  = 444.684
216  ex  = 0.100482
217  sx  = 0.280512
218  ba  = 1586.18
219  bs  = 3.25276
220  bca = 242.717
221  bcs = 15.7392
222  ac  = 282.445
223  ec  = 0.10187
224  sc  = 0.825364
225  ab  = 5
226
227  do for [i=1:N] {
228  axI[i]  = ax
229  exI[i]  = ex
230  sxI[i]  = sx
231  abI[i]  = ab
232  baI[i]  = ba
233  bsI[i]  = bs
234  bcaI[i] = bca
```

```
235  bcsI[i] = bcs
236  acI[i]  = ac
237  ecI[i]  = ec
238  scI[i]  = sc
239  }
240
241  EPT_chs = "C1 C2 C3 C4 A1 A2 A3 A4"
242  EPT_chN = words(EPT_chs)
243  EPT_ch(ci) = word(EPT_chs, ci)
244
245
246  fI(I, x) = biXB(axI[I], exI[I], sxI[I], axI[I]/5, exI[I]*1.05, exI[I]*6, baI[I], bsI[I],
         x) + 0.5
247  f(x)     = biXB(ax,     ex,     sx,     ax/5,     ex*1.05,     ex*6,     ba,     bs,
         x) + 0.5
248
249  do for [ci=1:EPT_chN] {
250   CH=EPT_ch(ci)
251   eval "CHI = ".CH
252
253   do for [i=1:N] {
254    eval sprintf('if(exists("FM1_%s_ax_%d")) { axI[%d] =FM1_%s_ax_%d }', CH, i, i, CH, i
       )
255    eval sprintf('if(exists("FM1_%s_ex_%d")) { exI[%d] =FM1_%s_ex_%d }', CH, i, i, CH, i
       )
256    eval sprintf('if(exists("FM1_%s_sx_%d")) { sxI[%d] =FM1_%s_sx_%d }', CH, i, i, CH, i
       )
257    eval sprintf('if(exists("FM1_%s_ba_%d")) { baI[%d] =FM1_%s_ba_%d }', CH, i, i, CH, i
       )
258    eval sprintf('if(exists("FM1_%s_bs_%d")) { bsI[%d] =FM1_%s_bs_%d }', CH, i, i, CH, i
       )
259   }
260   if (plot_all) {
261    @DEFAULTS
262    set yra [100:*]
263    set xra [0:20]
264    set x2ra [0:20/exI[1]]
265    calstr(i) = sprintf('FM1 %-4s %3s°C X-ray: %6.4f mV/keV, σ %5.2f keV', CH, TEMP[i],
       exI[i]*mV, sxI[i]/exI[i])
266    plot for [TT in TEMPS] fn_xrays(TT) u 1:CHI tit calstr(ix(TT)) with histeps lt ix(TT)
       lw 2, \
267       for [i=1:N] fI(i,x) notit with lines lt i, \
268       Temp u (exI[$1]*75):2:(sxI[$1]) axis x1y2 title "Xray vs T" with xerrorline lw 3
       pt 7 lt 8
269    pause plot_pause "FM1 X-rays ".CH
270    }
271
272   x1 = 4
273   x2 = 12
274   y1 = 100
275
276   if (fit_all) {
277    set print resultfile append
278    do for [T in TEMPS] {
279     i = ix(T)
280     ax=axI[i];ex=exI[i];sx=sxI[i];ab=abI[i];ba=baI[i];bs=bsI[i]
281     fit [x1:x2] [y1:*] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba,
          bs
282     fit [x1:x2] [y1:*] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba,
       sx, bs, ex
283     axI[i]=ax;exI[i]=ex;sxI[i]=sx;abI[i]=ab;baI[i]=ba;bsI[i]=bs
284     print sprintf("FM1_%s_ax_%d  = %10.6g; FM1_%s_ax_err_%d  = %10.6g # %s °C %d", CH, i,
       ax, CH, i, ax_err, T, ci)
285     print sprintf("FM1_%s_ex_%d  = %10.6g; FM1_%s_ex_err_%d  = %10.6g # %s °C %d", CH, i,
       ex, CH, i, ex_err, T, ci)
286     print sprintf("FM1_%s_sx_%d  = %10.6g; FM1_%s_sx_err_%d  = %10.6g # %s °C %d", CH, i,
       sx, CH, i, sx_err, T, ci)
287     print sprintf("FM1_%s_ba_%d  = %10.6g; FM1_%s_ba_err_%d  = %10.6g # %s °C %d", CH, i,
       ba, CH, i, ba_err, T, ci)
288     print sprintf("FM1_%s_bs_%d  = %10.6g; FM1_%s_bs_err_%d  = %10.6g # %s °C %d", CH, i,
       bs, CH, i, bs_err, T, ci)
289     set x2ra [0:20/exI[i]]
290     replot
291     pause plot_pause "FM1 X-rays ".CH." ".T."°C"
292     }
293    unset print
294   }
295  }
296
297  # EPT Compton edge ############################################################
298
299  fI(I, x) = biC(acI[I], ecI[I], scI[I], bcaI[I], bcsI[I],  x) + 0.5
```

```
300  f(x)     = biC(ac,     ec,     sc,     bca,     bcs,     x) + 0.5
301
302  do for [ci=1:EPT_chN] {
303   CH=EPT_ch(ci)
304   eval "CHI = ".CH
305
306   do for [i=1:N] {
307    eval sprintf('if(exists("FM1_%s_bca_%d")) { bcaI[%d]=FM1_%s_bca_%d }', CH, i, i, CH, i
       )
308    eval sprintf('if(exists("FM1_%s_bcs_%d")) { bcsI[%d]=FM1_%s_bcs_%d }', CH, i, i, CH, i
       )
309    eval sprintf('if(exists("FM1_%s_ac_%d"))  { acI[%d] =FM1_%s_ac_%d }',  CH, i, i, CH, i
       )
310    eval sprintf('if(exists("FM1_%s_ec_%d"))  { ecI[%d] =FM1_%s_ec_%d }',  CH, i, i, CH, i
       )
311    eval sprintf('if(exists("FM1_%s_sc_%d"))  { scI[%d] =FM1_%s_sc_%d }',  CH, i, i, CH, i
       )
312   }
313   if (plot_all) {
314    @DEFAULTS
315    set yra [1:*]
316    set xra [20:60]
317    set x2ra [0:60/ecI[1]]
318    calstr(i) = sprintf('FM1 %-4s %3s°C Compton: %6.4f mV/keV, σ %5.2f keV', CH, TEMP[i],
       ecI[i]*mV, scI[i]/ecI[i])
319    plot for [TT in TEMPS] fn_xrays(TT) u 1:CHI tit calstr(ix(TT)) with histeps lt ix(TT)
       lw 2, \
320       for [i=1:N] fI(i,x) notit with lines lt i, \
321       Temp u (ecI[$1]*393):2 axis x1y2 title "Compton vs T" with lp lw 3 pt 7 lt 8
322    pause plot_pause "FM1 Compton ".CH
323    }
324
325   x1 = 20
326   x2 = 50
327
328   if (fit_all) {
329    set print resultfile append
330    do for [T in TEMPS] {
331     i = ix(T)
332     bca=bcaI[i];bcs=bcsI[i];ac=acI[i];ec=ecI[i];sc=scI[i];
333     fit [x1:x2] [*:*] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca
334     fit [x1:x2] [*:*] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca,
          bcs, ec
335     fit [x1:x2] [*:*] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca,
        sc, bcs, ec
336     bcaI[i]=bca;bcsI[i]=bcs;acI[i]=ac;ecI[i]=ec;scI[i]=sc;
337     print sprintf("FM1_%s_bca_%d = %10.6g; FM1_%s_bca_err_%d = %10.6g # %s °C %d", CH, i,
        bca, CH, i, bca_err, T, ci)
338     print sprintf("FM1_%s_bcs_%d = %10.6g; FM1_%s_bcs_err_%d = %10.6g # %s °C %d", CH, i,
        bcs, CH, i, bcs_err, T, ci)
339     print sprintf("FM1_%s_ac_%d  = %10.6g; FM1_%s_ac_err_%d  = %10.6g # %s °C %d", CH, i,
        ac , CH, i, ac_err , T, ci)
340     print sprintf("FM1_%s_ec_%d  = %10.6g; FM1_%s_ec_err_%d  = %10.6g # %s °C %d", CH, i,
        ec , CH, i, ec_err , T, ci)
341     print sprintf("FM1_%s_sc_%d  = %10.6g; FM1_%s_sc_err_%d  = %10.6g # %s °C %d", CH, i,
        sc , CH, i, sc_err , T, ci)
342     set x2ra [0:60/ecI[i]]
343     replot
344     pause plot_pause "FM1 Compton ".CH." ".T."°C"
345     }
346    unset print
347   }
348
349  }
350
351  # EPT Gain TC ##############################################################
352
353  do for [i=1:30] { ee0[i]=1.0;  ee1[i]=1.0;  ee2[i]=1.0; }
354
355  v(ci, v) = "FM1_".EPT_ch(ci)."_".v
356
357  do for [ci=1:EPT_chN] {
358   if (exist(v(ci,'ee0'))) { eval "ee0[".ci."] = ".v(ci,'ee0') }
359   if (exist(v(ci,'ee1'))) { eval "ee1[".ci."] = ".v(ci,'ee1') }
360   if (exist(v(ci,'ee2'))) { eval "ee2[".ci."] = ".v(ci,'ee2') }
361  }
362
363  fn_ept_cal(c, l) = "<awk '/_".c."_e".l."_/;/_a[cx]_1/{print Nix}' ".resultfile
364  f_ept_cal(ci, t) =  ee0[ci]*(1 + t*(ee1[ci]/100 + ee2[ci]/1e6*t))
365
366  if (plot_all) {
367    @DEFAULTS
```

```
368     set xra [*:*]
369     set yra [*:*]
370     set xlab "Temperature"
371     set format x "%.0f°C"
372     unset log
373     calstr(i) = sprintf('FM1 %s %.4f×(1 %+.3g %%/°C T %+.3g pp/°C² T²) mV/keV', EPT_ch(i),
          ee0[i], ee1[i], ee2[i])
374     plot for [cii=1:EPT_chN] fn_ept_cal(EPT_ch(cii), 'x') u 8:3:6 notit w errorline lt cii
          pt 2, \
375          for [cii=1:EPT_chN] fn_ept_cal(EPT_ch(cii), 'c') u 8:3:6 notit w errorline lt cii
          pt 6, \
376          for [cii=1:EPT_chN] f_ept_cal(cii, x) tit calstr(cii) with l lt cii lw 3
377     pause plot_pause "FM1 EPT TC"
378   }
379
380   if (fit_all) {
381    do for [ci=1:EPT_chN] {
382     CH=EPT_ch(ci)
383     e0=ee0[ci]; e1=ee1[ci]; e2=ee2[ci]
384     fit e0*(1 + x*(e1/100 + e2/1e6*x)) fn_ept_cal(CH, '[cx]') u 8:3:6 zerror via e0,e1,e2
385     ee0[ci]=e0; ee1[ci]=e1; ee2[ci]=e2
386     set print resultfile append
387     print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee0'), e0, v(ci,'ee0'), e0_err)
388     print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee1'), e1, v(ci,'ee1'), e1_err)
389     print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee2'), e2, v(ci,'ee2'), e2_err)
390     unset print
391     replot
392     pause plot_pause "FM1 EPT TC ".CH
393    }
394   }
395
396   if (!exist("FM1_EPT_e0")) { FM1_EPT_e0=1;  FM1_EPT_e1=1; FM1_EPT_e2=1 }
397   f(t) = FM1_EPT_e0*(1 + t*(FM1_EPT_e1/100 + FM1_EPT_e2/1e6*t))
398
399   if (plot_all) {
400     @DEFAULTS
401     set xra [*:*]
402     set yra [*:*]
403     set xlab "Temperature"
404     set format x "%.0f°C"
405     unset log
406     calstr(i) = sprintf('FM1 EPT %.4f×(1 %+.2g %%/°C T %+.2g ppm/°C² T²) mV/keV',
        FM1_EPT_e0, FM1_EPT_e1, FM1_EPT_e2)
407     plot for [cii=1:EPT_chN] fn_ept_cal(EPT_ch(cii), 'x') u 8:($3/ee0[$10]):6 tit EPT_ch(
        cii) w errorline lt cii pt 2, \
408          for [cii=1:EPT_chN] fn_ept_cal(EPT_ch(cii), 'c') u 8:($3/ee0[$10]):6 notit
              w errorline lt cii pt 6, \
409          f(x) tit calstr(1) with l lt 8 lw 3
410     pause plot_pause "FM1 EPT TC"
411   }
412
413   if (fit_all) {
414     fit f(x) fn_ept_cal('[CA][1234]', '[cx]') u 8:($3/ee0[$10]):6 zerror via FM1_EPT_e0,
        FM1_EPT_e1, FM1_EPT_e2
415     set print resultfile append
416     print sprintf("FM1_EPT_e0 = %10.6g; FM1_EPT_e0_err = %10.6g", FM1_EPT_e0,
        FM1_EPT_e0_err)
417     print sprintf("FM1_EPT_e1 = %10.6g; FM1_EPT_e1_err = %10.6g", FM1_EPT_e1,
        FM1_EPT_e1_err)
418     print sprintf("FM1_EPT_e2 = %10.6g; FM1_EPT_e2_err = %10.6g", FM1_EPT_e2,
        FM1_EPT_e2_err)
419     unset print
420     replot
421     pause plot_pause "FM1 EPT TC"
422   }
423
424   print sprintf("FM1_EPT_TC = 1.0 / (1 + T_HET1*(%.4g %+.4g*T_HET1))", FM1_EPT_e1/100,
        FM1_EPT_e2/1e6)
425   do for [ci=1:EPT_chN] {
426       CH=EPT_ch(ci)
427       print sprintf("FM1_%s_calib = %.3f * FM1_EPT_TC", CH, 1/mV/ee0[ci])
428   }
429
430   # C1H Xrays and Compton edge
        ##########################################################
431
432   ex      = 0.620193 *43.8/45.8
433   ec      = ex
434
435   biXI(I,x) = biXB(axI[I], exI[I], sxI[I], abI[I], exI[I]*1.05, exI[I]*6, baI[I], bsI[I],
        x)
436   biCI(I,x) =  biC(acI[I], ecI[I], scI[I], bcaI[I], bcsI[I],  x)
437   fI(I, x) = biXI(I, x) + biCI(I, x) + 0.5
```

```
438  f(x) =  biXB(ax, ex, sx, ab, ex*1.05, ex*6, ba, bs,  x) + biC(ac, ec, sc, bca, bcs,  x)
         + 0.5
439
440  do for [i=1:N] {
441   axI[i]  = ax
442   exI[i]  = ex
443   sxI[i]  = sx
444   abI[i]  = ab
445   baI[i]  = ba
446   bsI[i]  = bs
447   bcaI[i] = bca
448   bcsI[i] = bcs
449   acI[i]  = ac
450   ecI[i]  = ec
451   scI[i]  = sc
452  }
453
454  do for [CH in "C1H"] {
455
456   eval "CHI = ".CH
457
458   do for [i=1:N] {
459    eval sprintf('if(exists("FM1_%s_ax_%d"))  { axI[%d] =FM1_%s_ax_%d }', CH, i, i, CH, i
        )
460    eval sprintf('if(exists("FM1_%s_ex_%d"))  { exI[%d] =FM1_%s_ex_%d }', CH, i, i, CH, i
        )
461    eval sprintf('if(exists("FM1_%s_sx_%d"))  { sxI[%d] =FM1_%s_sx_%d }', CH, i, i, CH, i
        )
462    eval sprintf('if(exists("FM1_%s_ab_%d"))  { abI[%d] =FM1_%s_ab_%d }', CH, i, i, CH, i
        )
463    eval sprintf('if(exists("FM1_%s_ba_%d"))  { baI[%d] =FM1_%s_ba_%d }', CH, i, i, CH, i
        )
464    eval sprintf('if(exists("FM1_%s_bs_%d"))  { bsI[%d] =FM1_%s_bs_%d }', CH, i, i, CH, i
        )
465    eval sprintf('if(exists("FM1_%s_bca_%d")) { bcaI[%d]=FM1_%s_bca_%d }', CH, i, i, CH, i
        )
466    eval sprintf('if(exists("FM1_%s_bcs_%d")) { bcsI[%d]=FM1_%s_bcs_%d }', CH, i, i, CH, i
        )
467    eval sprintf('if(exists("FM1_%s_ac_%d"))  { acI[%d] =FM1_%s_ac_%d }', CH, i, i, CH, i
        )
468    eval sprintf('if(exists("FM1_%s_ec_%d"))  { ecI[%d] =FM1_%s_ec_%d }', CH, i, i, CH, i
        )
469    eval sprintf('if(exists("FM1_%s_sc_%d"))  { scI[%d] =FM1_%s_sc_%d }', CH, i, i, CH, i
        )
470   }
471
472   if (plot_all) {
473    @DEFAULTS
474    set yra [10:10000]
475    set xra [0:300]
476    set x2ra [0:300/exI[1]]
477    calstr(i) = sprintf('FM1 %-4s %3s°C X-ray: %6.4f mV/keV, σ %5.2f keV, C: %6.4f mV/keV,
         σ %5.2f keV', \
478      CH, TEMP[i], exI[i]*mV, sxI[i]/exI[i], ecI[i]*mV, scI[i]/ecI[i])
479    plot for [TT in TEMPS] fn_xrays(TT) u 1:CHI tit calstr(ix(TT)) with histeps lt ix(TT)
         lw 2, \
480       for [ii=1:N] fI(ii,x) notit with lines lt ii, \
481       Temp u (ecI[$1]*393):2 axis x1y2 title "Compton vs T" with lp lw 3 pt 7 lt 7, \
482       Temp u (exI[$1]*75):2:(sxI[$1]) axis x1y2 title "Xray vs T" with xerrorline lw 3
        pt 7 lt 8
483    pause plot_pause "FM1 ".CH
484   }
485
486   x1 = 24
487   x2 = 280
488
489   if (fit_all) {
490    set print resultfile append
491    do for [T in TEMPS] {
492     i = ix(T)
493     ax=axI[i];ex=exI[i];sx=sxI[i];ab=abI[i];ba=baI[i];bs=bsI[i];bca=bcaI[i];bcs=bcsI[i];
          ac=acI[i];ec=ecI[i];sc=scI[i];
494     fit [x1:x2] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ac, ab, ba,
          bca
495     fit [x1:x2] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ac, ab, ba,
          bca,                    ex, ec
496     fit [x1:x2] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ac, ab, ba,
          bca, sx, sc, bs, bcs, ex, ec
497     axI[i]=ax;exI[i]=ex;sxI[i]=sx;abI[i]=ab;baI[i]=ba;bsI[i]=bs;bcaI[i]=bca;bcsI[i]=bcs;
          acI[i]=ac;ecI[i]=ec;scI[i]=sc;
498     print sprintf("FM1_%s_ax_%d  = %10.6g; FM1_%s_ax_err_%d  = %10.6g # %s °C", CH, i, ax
          , CH, i, ax_err , T)
499     print sprintf("FM1_%s_ex_%d  = %10.6g; FM1_%s_ex_err_%d  = %10.6g # %s °C", CH, i, ex
```

```
        , CH, i, ex_err , T)
500     print sprintf("FM1_%s_sx_%d  = %10.6g; FM1_%s_sx_err_%d  = %10.6g # %s °C", CH, i, sx
        , CH, i, sx_err , T)
501     print sprintf("FM1_%s_ab_%d  = %10.6g; FM1_%s_ab_err_%d  = %10.6g # %s °C", CH, i, ab
        , CH, i, ab_err , T)
502     print sprintf("FM1_%s_ba_%d  = %10.6g; FM1_%s_ba_err_%d  = %10.6g # %s °C", CH, i, ba
        , CH, i, ba_err , T)
503     print sprintf("FM1_%s_bs_%d  = %10.6g; FM1_%s_bs_err_%d  = %10.6g # %s °C", CH, i, bs
        , CH, i, bs_err , T)
504     print sprintf("FM1_%s_bca_%d = %10.6g; FM1_%s_bca_err_%d = %10.6g # %s °C", CH, i,
        bca, CH, i, bca_err , T)
505     print sprintf("FM1_%s_bcs_%d = %10.6g; FM1_%s_bcs_err_%d = %10.6g # %s °C", CH, i,
        bcs, CH, i, bcs_err , T)
506     print sprintf("FM1_%s_ac_%d  = %10.6g; FM1_%s_ac_err_%d  = %10.6g # %s °C", CH, i, ac
        , CH, i, ac_err , T)
507     print sprintf("FM1_%s_ec_%d  = %10.6g; FM1_%s_ec_err_%d  = %10.6g # %s °C", CH, i, ec
        , CH, i, ec_err , T)
508     print sprintf("FM1_%s_sc_%d  = %10.6g; FM1_%s_sc_err_%d  = %10.6g # %s °C", CH, i, sc
        , CH, i, sc_err , T)
509     set x2ra [0:300/exI[i]]
510     replot
511     pause plot_pause "FM1 ".CH." ".T."°C"
512    }
513    unset print
514   }
515
516  }
517
518  if (!exist("FM1_C1H_ee0")) { FM1_C1H_ee0 = 0.101327 }
519  if (!exist("FM1_C1H_ee1")) { FM1_C1H_ee1 = 2.15528e-05 }
520  if (!exist("FM1_C1H_ee2")) { FM1_C1H_ee2 = -2.15528e-05 }
521
522  if (plot_all) {
523    @DEFAULTS
524    set xra [*:*]
525    set yra [*:*]
526    set xlab "Temperature"
527    set format x "%.0f°C"
528    unset log
529    calstr(i) = sprintf('FM1 C1H (%.4f + %.1f ppm/°C × T − %g ppm/°C^2 × T^2) mV/keV',
       FM1_C1H_ee0, FM1_C1H_ee1*1e6, -FM1_C1H_ee2*1e6)
530    plot for [l in "x c"] "<awk '/_C.H_e".l."_/;/_ax_1/{print Nix}' ".resultfile u 8:3:6
       tit "e".l w errorline, \
531       FM1_C1H_ee0+FM1_C1H_ee1*x+FM1_C1H_ee2*x*x tit calstr(1) with l lw 3
532    pause plot_pause "FM1 HET C"
533  }
534
535  if (fit_all) {
536    fit FM1_C1H_ee0+FM1_C1H_ee1*x+FM1_C1H_ee2*x*x "<awk '/_C.H_e[xc]_/' ".resultfile u
       8:3:6 zerror via FM1_C1H_ee0,FM1_C1H_ee1,FM1_C1H_ee2
537    set print resultfile append
538    print sprintf("FM1_C1H_ee0  = %10.6g; FM1_C1H_ee0_err  = %10.6g", FM1_C1H_ee0,
       FM1_C1H_ee0_err)
539    print sprintf("FM1_C1H_ee1  = %10.6g; FM1_C1H_ee1_err  = %10.6g", FM1_C1H_ee1,
       FM1_C1H_ee1_err)
540    print sprintf("FM1_C1H_ee2  = %10.6g; FM1_C1H_ee2_err  = %10.6g", FM1_C1H_ee2,
       FM1_C1H_ee2_err)
541    unset print
542    replot
543    pause plot_pause "FM1 ".CH." TC"
544  }
545
546  print sprintf("FM1_C1H_SiH_calib = %.3f / (1+T_HET1*(%.4g %+.4g*T_HET1))", 1/mV/
       FM1_C1H_ee0, FM1_C1H_ee1/FM1_C1H_ee0, FM1_C1H_ee2/FM1_C1H_ee0)
547
548  # C BB muons  ############################################################
549
550  x1 = 500
551  x2 = 2000
552  a=10
553  e=1200
554  s=e/10
555
556  do for [i=1:N] { aI[i]=a; eI[i]=e; sI[i]=s; eI_err[i]=1 }
557  CH="BB_C"
558
559  do for [i=1:N] {
560   eval sprintf('if(exists("FM1_%s_e_%d")) { eI[%d]=FM1_%s_e_%d }', CH, i, i, CH, i)
561   eval sprintf('if(exists("FM1_%s_a_%d")) { aI[%d]=FM1_%s_a_%d }', CH, i, i, CH, i)
562   eval sprintf('if(exists("FM1_%s_s_%d")) { sI[%d]=FM1_%s_s_%d }', CH, i, i, CH, i)
563   eval sprintf('if(exists("FM1_%s_e_err_%d")) { eI_err[%d]=FM1_%s_e_err_%d }', CH, i, i,
       CH, i)
```

```
564  }
565
566  if (plot_all) {
567    @DEFAULTS
568    set key noenhanced reverse Left box height 0.5
569    set xra [x1:x2]
570    set yra [0:*]
571    unset log y
572    unset x2tics
573    unset x2lab
574    set xlab "pulse height in C [mV]"
575    set grid
576    calstr(i) = sprintf('FM1 %s %3s°C peak %5.0f width %.4f height %5.0f', CH, TEMP[i], eI
       [i], sI[i]/eI[i], aI[i]*sI[i])
577    plot for [TT in TEMPS] fn_bb_c(TT) tit calstr(ix(TT)) with histeps lt ix(TT) lw 2, \
578         for [i=1:N] mips(aI[i], eI[i], sI[i], x) notit with lines lt i, \
579         Temp u (eI[$1]):2 axis x1y2 title "peak vs T" with lp lw 3 pt 7 lt 7
580    pause plot_pause "FM1 BB muons in C"
581  }
582
583  if (fit_all) {
584    set print resultfile append
585    do for [T in TEMPS] {
586     i = ix(T)
587     e=eI[i]; a=aI[i]; s=sI[i];
588     fit [0.75*e:1.8*e] mips(a,e,s, x) fn_bb_c(T) using 1:2:(sqrt($2+10)) zerror via a,e,s
589     eI[i]=e; aI[i]=a; sI[i]=s; eI_err[i] = e_err
590     print sprintf("FM1_%s_e_%d  = %10.6g; FM1_%s_e_err_%d  = %10.6g # %s °C", CH, i, e,
        CH, i, e_err , T)
591     print sprintf("FM1_%s_a_%d  = %10.6g; FM1_%s_a_err_%d  = %10.6g # %s °C", CH, i, a,
        CH, i, a_err , T)
592     print sprintf("FM1_%s_s_%d  = %10.6g; FM1_%s_s_err_%d  = %10.6g # %s °C", CH, i, s,
        CH, i, s_err , T)
593     replot
594     pause plot_pause "FM1 BB muons in C ".T."°C"
595    }
596    unset print
597  }
598
599  FM1_BGO_cal(T) = FM1_BGO_BB0*(1-T*(FM1_BGO_BB1+T*(FM1_BGO_BB2/1e4)))
600  if (!exists("FM1_BGO_BB0")) { FM1_BGO_BB0 = 1000          }
601  if (!exists("FM1_BGO_BB1")) { FM1_BGO_BB1 = 7.3/FM1_BGO_BB0 }
602  if (!exists("FM1_BGO_BB2")) { FM1_BGO_BB2 = 0             }
603
604  s = sprintf("BB muons cal(T) = %.0f × (1 − %.3g%%/°C T + %.3g ppm/°C² T²)", FM1_BGO_BB0,
       100*FM1_BGO_BB1, −100*FM1_BGO_BB2)
605
606  if (plot_all) {
607    @DEFAULTS
608    set key enh
609    set xra [*:*]
610    unset log y
611    set yra [*:*]
612    set xlab "Temperature"
613    set format x "%.0f°C"
614    unset y2tics
615    unset x2tics
616    unset x2lab
617    plot Temp u 2:(eI[$1]):(eI_err[$1]) notit with errorlines, FM1_BGO_cal(x) tit s
618    pause plot_pause "FM1 BB muons in C temp model"
619  }
620
621  if (fit_all) {
622    eI_err[ix("30")] = 200
623    FM1_BGO_BB2 = 0.001
624    FM1_BGO_BB3 = 0; FM1_BGO_BB3_err = 0
625    set print resultfile append
626    fit FM1_BGO_cal(x) Temp u 2:(eI[$1]):(eI_err[$1]) zerror via FM1_BGO_BB0, FM1_BGO_BB1,
        FM1_BGO_BB2
627    print 'GPFUN_FM1_BGO_cal="'.GPFUN_FM1_BGO_cal.'"'
628    print sprintf("FM1_BGO_BB0 = %10.6g ; FM1_BGO_BB0_err = %10.6g", FM1_BGO_BB0,
       FM1_BGO_BB0_err)
629    print sprintf("FM1_BGO_BB1 = %10.6g ; FM1_BGO_BB1_err = %10.6g", FM1_BGO_BB1,
       FM1_BGO_BB1_err)
630    print sprintf("FM1_BGO_BB2 = %10.6g ; FM1_BGO_BB2_err = %10.6g", FM1_BGO_BB2,
       FM1_BGO_BB2_err)
631    unset print
632    replot
633    pause plot_pause "FM1 BB muons in C temp model"
634  }
635
636  # C ABBA muons  ############################################################
```

```
637
638  abba_cut = "$2<28 || $2>32"
639  fn_abba(c, cut) = "<awk '".cut."' ".fn_base."-x.BGO_T | hist.py -k ".c." -s 1./30 "
640
641  f(x) = mips(FM1_ABBA_C_a,FM1_ABBA_C_e*keV_ABBA,FM1_ABBA_C_s, x)
642  if (!exist("FM1_ABBA_C_a")) { FM1_ABBA_C_a = 10          }
643  if (!exist("FM1_ABBA_C_e")) { FM1_ABBA_C_e = 1000/keV_ABBA }
644  if (!exist("FM1_ABBA_C_s")) { FM1_ABBA_C_s = 100         }
645
646  if (plot_all) {
647    @DEFAULTS
648    set key enh
649    set xra  [400:2000]
650    set x2ra [400/FM1_ABBA_C_e:2000/FM1_ABBA_C_e]
651    unset log y
652    set yra [*:*]
653    plot fn_abba(7, 1) tit "uncal" w histeps, fn_abba(8, 1) tit "uncut" w histeps, fn_abba
       (8, abba_cut) tit "cut" w histeps lw 2, f(x)
654    pause plot_pause "FM1 ABBA muons"
655  }
656
657  if (fit_all) {
658    set print resultfile append
659    fit f(x) fn_abba(8, abba_cut) u 1:2:(sqrt($2+3)) via FM1_ABBA_C_a, FM1_ABBA_C_e,
       FM1_ABBA_C_s
660    print sprintf("FM1_ABBA_C_a = %10.6g; FM1_ABBA_C_a_err = %10.6g", FM1_ABBA_C_a,
       FM1_ABBA_C_a_err)
661    print sprintf("FM1_ABBA_C_e = %10.6g; FM1_ABBA_C_e_err = %10.6g", FM1_ABBA_C_e,
       FM1_ABBA_C_e_err)
662    print sprintf("FM1_ABBA_C_s = %10.6g; FM1_ABBA_C_s_err = %10.6g", FM1_ABBA_C_s,
       FM1_ABBA_C_s_err)
663    unset print
664    set x2ra [400/mV/FM1_ABBA_C_e:2000/mV/FM1_ABBA_C_e]
665    replot
666    pause plot_pause "FM1 ABBA muons"
667  }
668
669  if (plot_all) {
670    @DEFAULTS
671    set key enh
672    set xra [*:*]
673    unset log y
674    set yra [*:*]
675    set xlab "Temperature"
676    set format x "%.0f°C"
677    unset y2tics
678    unset x2tics
679    unset x2lab
680    plot Temp u 2:(exI[$1]*mV/FM1_ABBA_C_e*FM1_BGO_BB0/FM1_BGO_cal($2)) tit "C1H Si/BGO
       ratio" with lp
681    pause plot_pause "Si/Light ratio"
682  }
683
684  #FM1_BGO_cal(T) = FM1_BGO_BB0*(1-T*(FM1_BGO_BB1+T*(FM1_BGO_BB2/1e4)))
685  print sprintf("FM1_BGO_calib = %.3f / (1 - T_HET1*(%.4g %+.4g*T_HET1))", 1/FM1_ABBA_C_e,
       FM1_BGO_BB1, FM1_BGO_BB2/1e4)
686
687  # C2H/C1H gain ratio  ##############################################################
688
689  x1 = 1000
690  x2 = 5000
691  ratio = 1.0
692
693  CH="C2H_C1H"
694
695  do for [i=1:N] { eI[i]=ratio }
696  do for [i=1:N] { eval sprintf('if(exists("FM1_%s_ratio_%d")) { eI[%d]=FM1_%s_ratio_%d }'
       , CH, i, i, CH, i) }
697
698  fn(T) = "<./HETEPT.awk 'isBB()>1{print $C2H/$C1H}' SiH_ratio=1.1 ".fn_bb(T)." | hist.py
       -s 100"
699
700  if (plot_all) {
701    @DEFAULTS
702    set key noenhanced
703    set xra [500:5000]
704    set yra [0.8:1.2]
705    unset log y
706    set log x
707    set x2ra [*:*]
708    set format x2 "%.1f°C"
709    set y2lab "Temperature"
710    calstr(i) = sprintf('FM1 %s %3s°C ratio %.4g', CH, TEMP[i], eI[i])
```

```
711     plot for [TT in TEMPS] fn_bgo(TT) u 3:($4/$3) notit with p lt ix(TT) pt 2 ps 0.5, \
712          for [i=1:N] eI[i] tit calstr(i) with lines lt i lw 2, \
713          Temp u 2:(eI[$1]) axis x2y1 not with lp lt 8 pt 7
714     pause plot_pause "FM1 C2H/C1H"
715   }
716
717   if (fit_all) {
718     set print resultfile append
719     do for [T in TEMPS] {
720       i = ix(T)
721       e = eI[i]
722       fit [500:5000] [500:5000] e*x fn_bgo(T) u 3:4:(sqrt(1.0/$3/$4)) zerror via e
723       eI[i]=e
724       print sprintf("FM1_%s_ratio_%d  = %10.6g; FM1_%s_ratio_err_%d  = %10.6g # %s °C", CH,
            i, e, CH, i, e_err , T)
725       replot
726       pause plot_pause "FM1 C2H/C1H"
727     }
728     unset print
729   }
730
731   # C.L/C.H gain ratio  ##########################################################
732
733   ratio = 14
734
735   do for [CHi=1:2] {
736    CH = "C".CHi."L"
737
738    do for [i=1:N] { eval sprintf('if(exists("FM1_%s_ratio_%d")) { eI[%d]=FM1_%s_ratio_%d }
          ', CH, i, i, CH, i) }
739    do for [i=1:N] { eval sprintf('if(exists("FM1_%s_ratio_err_%d")) { eI_err[%d]=FM1_%
          s_ratio_err_%d }', CH, i, i, CH, i) }
740
741    if (plot_all) {
742     @DEFAULTS
743     set xra [500:30000]
744     set yra [0.065:0.08]
745     unset log y
746     set log x
747     set x2ra [*:*]
748     set format x2 "%.1f°C"
749     set y2lab "Temperature"
750     calstr(i) = sprintf('FM1 %s %3s°C ratio %.2f', CH, TEMP[i], eI[i])
751     plot for [TT in TEMPS] fn_bgo(TT) u 2+CHi:(column(4+CHi)/column(2+CHi)) notit with p
          lt ix(TT) pt 2 ps 0.5, \
752          for [i=1:N] 1.0/eI[i] tit calstr(i) with lines lt i lw 2, \
753          Temp u 2:(1.0/eI[$1]) axis x2y1 not with lp lt 8 pt 7
754     pause plot_pause "FM1 ".CH
755    }
756
757    if (fit_all) {
758     set print resultfile append
759     do for [T in TEMPS] {
760       i = ix(T)
761       e = eI[i]
762       fit [2000:30000] [*:*]  x/e fn_bgo(T) u 2+CHi:4+CHi:(1.0/column(2+CHi)) zerror via e
763       eI[i]=e; eI_err[i]=e_err
764       print sprintf("FM1_%s_ratio_%d  = %10.6g; FM1_%s_ratio_err_%d  = %10.6g # %s °C", CH,
            i, e, CH, i, e_err , T)
765       replot
766     }
767     unset print
768    }
769   }
770
771   FM1_BGO_HL_cal(T) = FM1_BGO_HL0*(1 + T*(FM1_BGO_HL1 + T*(FM1_BGO_HL2)))
772   if (!exists("FM1_BGO_HL0")) { FM1_BGO_HL0 = 14     }
773   if (!exists("FM1_BGO_HL1")) { FM1_BGO_HL1 = 0.01   }
774   if (!exists("FM1_BGO_HL2")) { FM1_BGO_HL2 = 0.001  }
775
776   s = sprintf("BGO High/Low gain = %.0f × (1 %+.3g ppm/°C×T %+.3g ppm/°C²×T²)",
        FM1_BGO_HL0, 1e6*FM1_BGO_HL1, 1e6*FM1_BGO_HL2)
777
778   fn(CH) = "<awk '/_ratio_1/{print Nix};/FM1_".CH."_ratio/' ".resultfile
779
780   if (plot_all) {
781     @DEFAULTS
782     set key enh
783     set xra [*:*]
784     unset log y
785     set yra [*:*]
786     set xlab "Temperature"
```

```
787     set format x "%.0f°C"
788     unset y2tics
789     unset x2tics
790     unset x2lab
791     plot  for [c in "C1L C2L"] fn(c) u 8:3:6 tit c w errorline pt 7, \
792           FM1_BGO_HL_cal(x) tit s w l lw 2
793     pause plot_pause "FM1 BB high/low"
794   }
795
796   if (fit_all) {
797     FM1_BGO_HL2 = 0.001
798     set print resultfile append
799     fit FM1_BGO_HL_cal(x) fn("C[12]L") u 8:3:6 zerror via FM1_BGO_HL0, FM1_BGO_HL1,
        FM1_BGO_HL2
800     print 'GPFUN_FM1_BGO_HL_cal="'.GPFUN_FM1_BGO_HL_cal.'"'
801     print sprintf("FM1_BGO_HL0 = %10.6g ; FM1_BGO_HL0_err = %10.6g", FM1_BGO_HL0,
        FM1_BGO_HL0_err)
802     print sprintf("FM1_BGO_HL1 = %10.6g ; FM1_BGO_HL1_err = %10.6g", FM1_BGO_HL1,
        FM1_BGO_HL1_err)
803     print sprintf("FM1_BGO_HL2 = %10.6g ; FM1_BGO_HL2_err = %10.6g", FM1_BGO_HL2,
        FM1_BGO_HL2_err)
804     unset print
805     replot
806     pause plot_pause "FM1 BB high/low"
807   }
808
809   # FM1_BGO_HL_cal(T) = FM1_BGO_HL0*(1 + T*(FM1_BGO_HL1 + T*(FM1_BGO_HL2)))
810   print sprintf("FM1_BGO_L_calib = FM1_BGO_calib * %.3f * (1 + T_HET1*(%.4g %+.4g*T_HET1))
        ", FM1_BGO_HL0, FM1_BGO_HL1, FM1_BGO_HL2)
811
812   # HET AB X-rays  edge ############################################################
813
814   ax  = 444.684
815   ex  = 0.100482   *5.5/7.4
816   sx  = 0.280512
817   ab  = 52.2564
818   ba  = 1586.18
819   bs  = 3.25276
820   bca = 242.717
821   bcs = 15.7392
822   ac  = 282.445
823   ec  = ex
824   sc  = 0.825364
825
826   do for [i=1:N] {
827   axI[i]  = ax
828   exI[i]  = ex
829   sxI[i]  = sx
830   abI[i]  = ab
831   baI[i]  = ba
832   bsI[i]  = bs
833   bcaI[i] = bca
834   bcsI[i] = bcs
835   acI[i]  = ac
836   ecI[i]  = ec
837   scI[i]  = sc
838   }
839
840   HET_chs = "A11H A12H A21H A22H B11H B12H"
841   HET_chN = words(HET_chs)
842   HET_ch(ci) = word(HET_chs, ci)
843
844   fxI(I, x) = biXB(axI[I], exI[I], sxI[I], axI[i]/5, exI[I]*1.05, exI[I]*6, baI[I], bsI[I
        ], x) + 0.5
845   fx(x)     = biXB(ax,     ex,     sx,     ax/5,     ex*1.05,     ex*6,     ba,     bs,
          x) + 0.5
846
847   do for [ci=1:HET_chN] {
848    CH= HET_ch(ci)
849    eval "CHI = ".CH
850
851    do for [i=1:N] {
852     eval sprintf('if(exists("FM1_%s_ax_%d")) { axI[%d] =FM1_%s_ax_%d }', CH, i, i, CH, i
         )
853     eval sprintf('if(exists("FM1_%s_ex_%d")) { exI[%d] =FM1_%s_ex_%d }', CH, i, i, CH, i
         )
854     eval sprintf('if(exists("FM1_%s_sx_%d")) { sxI[%d] =FM1_%s_sx_%d }', CH, i, i, CH, i
         )
855     eval sprintf('if(exists("FM1_%s_ba_%d")) { baI[%d] =FM1_%s_ba_%d }', CH, i, i, CH, i
         )
856     eval sprintf('if(exists("FM1_%s_bs_%d")) { bsI[%d] =FM1_%s_bs_%d }', CH, i, i, CH, i
         )
857   }
```

```
858
859   if (plot_all) {
860    @DEFAULTS
861    set yra [10:*]
862    set xra [0:15]
863    set x2ra [0:15/exI[1]]
864    calstr(i) = sprintf('FM1 %-4s %3s°C X-ray: %6.4f mV/keV, σ %5.2f keV', \
865      CH, TEMP[i], exI[i]*mV, sxI[i]/exI[i])
866    plot for [TT in TEMPS] fn_xrays(TT) u 1:CHI tit calstr(ix(TT)) with histeps lt ix(TT)
         lw 2, \
867        for [i=1:N] fxI(i,x) notit with lines lt i, \
868        Temp u (exI[$1]*75):2:(sxI[$1]) axis x1y2 title "Xray vs T" with xerrorline lw 3
         pt 7 lt 8
869    pause plot_pause "FM1 X-ray ".CH
870    }
871
872   x1 = 3
873   x2 = 8
874
875   if (fit_all) {
876    set print resultfile append
877    do for [T in TEMPS] {
878     i = ix(T)
879     ax=axI[i];ex=exI[i];sx=sxI[i];ab=abI[i];ba=baI[i];bs=bsI[i]
880     fit [x1:x2] fx(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba
881     fit [x1:x2] fx(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba, sx, bs
          , ex
882     axI[i]=ax;exI[i]=ex;sxI[i]=sx;abI[i]=ab;baI[i]=ba;bsI[i]=bs
883     print sprintf("FM1_%s_ax_%d  = %10.6g; FM1_%s_ax_err_%d  = %10.6g # %s °C %d", CH, i,
          ax, CH, i, ax_err, T, ci)
884     print sprintf("FM1_%s_ex_%d  = %10.6g; FM1_%s_ex_err_%d  = %10.6g # %s °C %d", CH, i,
          ex, CH, i, ex_err, T, ci)
885     print sprintf("FM1_%s_sx_%d  = %10.6g; FM1_%s_sx_err_%d  = %10.6g # %s °C %d", CH, i,
          sx, CH, i, sx_err, T, ci)
886     print sprintf("FM1_%s_ba_%d  = %10.6g; FM1_%s_ba_err_%d  = %10.6g # %s °C %d", CH, i,
          ba, CH, i, ba_err, T, ci)
887     print sprintf("FM1_%s_bs_%d  = %10.6g; FM1_%s_bs_err_%d  = %10.6g # %s °C %d", CH, i,
          bs, CH, i, bs_err, T, ci)
888     set x2ra [0:15/exI[i]]
889     replot
890     pause plot_pause "FM1 X-ray ".CH." ".T
891     }
892    unset print
893   }
894
895  }
896
897  # HET AB Compton edge ##########################################################
898
899  fcI(I, x) = biC(acI[I], ecI[I], scI[I], bcaI[I], bcsI[I],  x) + 0.5
900  fc(x)     = biC(ac,     ec,     sc,     bca,     bcs,      x) + 0.5
901
902  do for [ci=1:HET_chN] {
903   CH= HET_ch(ci)
904   eval "CHI = ".CH
905
906   do for [i=1:N] {
907    eval sprintf('if(exists("FM1_%s_ex_%d"))   { ecI[%d] =FM1_%s_ex_%d }',   CH, i, i, CH,
         i)
908    eval sprintf('if(exists("FM1_%s_ac_%d"))   { acI[%d] =FM1_%s_ac_%d }',   CH, i, i, CH,
         i)
909    eval sprintf('if(exists("FM1_%s_ec_%d"))   { ecI[%d] =FM1_%s_ec_%d }',   CH, i, i, CH,
         i)
910    eval sprintf('if(exists("FM1_%s_sc_%d"))   { scI[%d] =FM1_%s_sc_%d }',   CH, i, i, CH,
         i)
911    eval sprintf('if(exists("FM1_%s_bca_%d"))  { bcaI[%d] =FM1_%s_bca_%d }',  CH, i, i, CH
       , i)
912    eval sprintf('if(exists("FM1_%s_bcs_%d"))  { bcsI[%d] =FM1_%s_bcs_%d }',  CH, i, i, CH
       , i)
913    }
914
915   if (plot_all) {
916    @DEFAULTS
917    set yra [1:*]
918    set xra [0:60]
919    set x2ra [0:60/ecI[1]]
920    calstr(i) = sprintf('FM1 %-4s %3s°C Compton: %6.4f mV/keV, σ %5.2f keV', CH, TEMP[i],
       ecI[i]*mV, scI[i]/ecI[i])
921    plot for [TT in TEMPS] fn_xrays(TT) u 1:CHI tit calstr(ix(TT)) with histeps lt ix(TT)
         lw 2, \
922        for [i=1:N] fcI(i,x) notit with lines lt i, \
923        Temp u (ecI[$1]*393):2:(scI[$1]) axis x1y2 title "Compton Edge vs T" with
```

```
        xerrorline lw 3 pt 7 lt 8
924     pause plot_pause "FM1 Compton ".CH
925     }
926
927    x1 = 20
928    x2 = 35
929
930    if (fit_all) {
931
932     set print resultfile append
933     do for [T in TEMPS] {
934      i = ix(T)
935      ac=acI[i];ec=ecI[i];sc=scI[i];bca=bcaI[i];bcs=bcsI[i]
936      fit [x1:x2] fc(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca, bcs
937      fit [x1:x2] fc(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca, bcs,
           ec
938      fit [x1:x2] fc(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca, bcs,
           ec, sc
939      acI[i]=ac;ecI[i]=ec;scI[i]=sc;bcaI[i]=bca;bcsI[i]=bcs
940      print sprintf("FM1_%s_ac_%d  = %10.6g; FM1_%s_ac_err_%d  = %10.6g # %s °C %d", CH, i,
           ac,  CH, i, ac_err,  T, ci)
941      print sprintf("FM1_%s_ec_%d  = %10.6g; FM1_%s_ec_err_%d  = %10.6g # %s °C %d", CH, i,
           ec,  CH, i, ec_err,  T, ci)
942      print sprintf("FM1_%s_sc_%d  = %10.6g; FM1_%s_sc_err_%d  = %10.6g # %s °C %d", CH, i,
           sc,  CH, i, sc_err,  T, ci)
943      print sprintf("FM1_%s_bca_%d = %10.6g; FM1_%s_bca_err_%d = %10.6g # %s °C %d", CH, i,
           bca, CH, i, bca_err, T, ci)
944      print sprintf("FM1_%s_bcs_%d = %10.6g; FM1_%s_bcs_err_%d = %10.6g # %s °C %d", CH, i,
           bcs, CH, i, bcs_err, T, ci)
945      set x2ra [0:60/ecI[i]]
946      replot
947      pause plot_pause "FM1 Compton ".CH." ".T
948      }
949     unset print
950     }
951
952   }
953
954   # HET AB TC ##############################################################
955
956   do for [i=1:30] { ee0[i]=0.075;  ee1[i]=1.0;  ee2[i]=1.0; }
957
958   v(ci, v) = "FM1_".HET_ch(ci)."_".v
959
960   do for [ci=1:HET_chN] {
961    if (exist(v(ci,'ee0'))) { eval "ee0[".ci."] = ".v(ci,'ee0') }
962    if (exist(v(ci,'ee1'))) { eval "ee1[".ci."] = ".v(ci,'ee1') }
963    if (exist(v(ci,'ee2'))) { eval "ee2[".ci."] = ".v(ci,'ee2') }
964   }
965
966   fn_het_cal(c, l) = "<awk '/_".c."_e".l."_/;/_a[cx]_1/{print Nix}' ".resultfile
967   f_het_cal(ci, t) =  ee0[ci]*(1 + t*(ee1[ci]/100 + ee2[ci]/1e6*t))
968
969   if (plot_all) {
970    @DEFAULTS
971    set xra [*:*]
972    set yra [0.06:0.083]
973    set xlab "Temperature"
974    set format x "%.0f°C"
975    unset log
976    calstr(i) = sprintf('FM1 %s %.4f×(1 %+.3g %%/°C T %+.3g pp/°C² T²) mV/keV', HET_ch(i),
         ee0[i], ee1[i], ee2[i])
977    plot for [cii=1:HET_chN] fn_het_cal(HET_ch(cii), 'x') u 8:3:6 notit w errorline lt cii
         pt 2, \
978          for [cii=1:HET_chN] fn_het_cal(HET_ch(cii), 'c') u 8:3:6 notit w errorline lt cii
         pt 6, \
979          for [cii=1:HET_chN] f_het_cal(cii, x) tit calstr(cii) with l lt cii lw 3
980    pause plot_pause "FM1 HET TC"
981   }
982
983   if (fit_all) {
984    do for [ci=1:HET_chN] {
985     CH=HET_ch(ci)
986     e0=ee0[ci]; e1=ee1[ci]; e2=ee2[ci]
987     fit [] [0.05:0.09] e0*(1 + x*(e1/100 + e2/1e6*x)) fn_het_cal(CH, '[cx]') u 8:3:6
          zerror via e0,e1,e2
988     ee0[ci]=e0; ee1[ci]=e1; ee2[ci]=e2
989     set print resultfile append
990     print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee0'), e0, v(ci,'ee0'), e0_err)
991     print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee1'), e1, v(ci,'ee1'), e1_err)
992     print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee2'), e2, v(ci,'ee2'), e2_err)
993     unset print
```

```
994     replot
995     pause plot_pause "FM1 HET TC ".CH
996    }
997   }
998
999   if (!exist("FM1_HET_e0")) { FM1_HET_e0=1;  FM1_HET_e1=1; FM1_HET_e2=1 }
1000  f(t) = FM1_HET_e0*(1 + t*(FM1_HET_e1/100 + FM1_HET_e2/1e6*t))
1001
1002  if (plot_all) {
1003    @DEFAULTS
1004    set xra [*:*]
1005    set yra [0.95:1.1]
1006    set xlab "Temperature"
1007    set format x "%.0f°C"
1008    unset log
1009    calstr(i) = sprintf('FM1 HET %.4f×(1 %+.2g %%/°C T %+.2g ppm/°C² T²) mV/keV',
          FM1_HET_e0, FM1_HET_e1, FM1_HET_e2)
1010    plot for [cii=1:HET_chN] fn_het_cal(HET_ch(cii), 'x') u 8:($3/ee0[$10]):6 tit HET_ch(
          cii) w errorline lt cii pt 2, \
1011       for [cii=1:HET_chN] fn_het_cal(HET_ch(cii), 'c') u 8:($3/ee0[$10]):6 notit
             w errorline lt cii pt 6, \
1012       f(x) tit calstr(1) with l lt 8 lw 3
1013    pause plot_pause "FM1 HET TC"
1014  }
1015
1016  if (fit_all) {
1017    fit f(x) fn_het_cal('[AB][12][12]H', '[cx]') u 8:($3/ee0[$10]):6 zerror via FM1_HET_e0
          , FM1_HET_e1, FM1_HET_e2
1018    set print resultfile append
1019    print sprintf("FM1_HET_e0 = %10.6g; FM1_HET_e0_err = %10.6g", FM1_HET_e0,
          FM1_HET_e0_err)
1020    print sprintf("FM1_HET_e1 = %10.6g; FM1_HET_e1_err = %10.6g", FM1_HET_e1,
          FM1_HET_e1_err)
1021    print sprintf("FM1_HET_e2 = %10.6g; FM1_HET_e2_err = %10.6g", FM1_HET_e2,
          FM1_HET_e2_err)
1022    unset print
1023    replot
1024    pause plot_pause "FM1 HET TC"
1025  }
1026
1027  print sprintf("FM1_HET_HG_TC = 1.0 / (1 + T_HET1*(%.4g %+.4g*T_HET1))", FM1_HET_e1/100,
        FM1_HET_e2/1e6)
1028  do for [ci=1:HET_chN] {
1029      CH=HET_ch(ci)
1030      print sprintf("FM1_%s_calib = %.3f * FM1_HET_HG_TC", CH, 1/mV/ee0[ci])
1031  }
1032
1033  # HET B.3 X-rays and Compton edge
       ###############################################################
1034
1035  ax  = 444.684
1036  ex  = 0.100482    *5.5/7.4
1037  sx  = 0.280512
1038  ab  = 52.2564
1039  ba  = 1586.18
1040  bs  = 3.25276
1041  bca = 242.717
1042  bcs = 15.7392
1043  ac  = 282.445
1044  ec  = ex
1045  sc  = 0.825364   *2
1046
1047  do for [i=1:N] {
1048  axI[i]  = ax
1049  exI[i]  = ex   *6.5/5.5
1050  sxI[i]  = sx
1051  abI[i]  = ab
1052  baI[i]  = ba
1053  bsI[i]  = bs
1054  bcaI[i] = bca
1055  bcsI[i] = bcs
1056  acI[i]  = ac
1057  ecI[i]  = ex
1058  scI[i]  = sc
1059  }
1060
1061
1062  fxI(I, x) = biXB(axI[I], exI[I], sxI[I], axI[i]/5, exI[I]*1.05, exI[I]*6, baI[I], bsI[I
       ],  x) + 0.5
1063  fx(x)     = biXB(ax,     ex,     sx,     ax/5,     ex*1.05,     ex*6,     ba,     bs,
           x) + 0.5
1064
1065  do for [CH in "B13G B23G"] {
```

```
1066
1067    eval "CHI = ".CH
1068
1069    do for [i=1:N] {
1070     eval sprintf('if(exists("FM1_%s_ax_%d")) { axI[%d] =FM1_%s_ax_%d }', CH, i, i, CH, i
          )
1071     eval sprintf('if(exists("FM1_%s_ex_%d")) { exI[%d] =FM1_%s_ex_%d }', CH, i, i, CH, i
          )
1072     eval sprintf('if(exists("FM1_%s_sx_%d")) { sxI[%d] =FM1_%s_sx_%d }', CH, i, i, CH, i
          )
1073     eval sprintf('if(exists("FM1_%s_ba_%d")) { baI[%d] =FM1_%s_ba_%d }', CH, i, i, CH, i
          )
1074     eval sprintf('if(exists("FM1_%s_bs_%d")) { bsI[%d] =FM1_%s_bs_%d }', CH, i, i, CH, i
          )
1075   }
1076
1077    if (plot_all) {
1078     @DEFAULTS
1079     set yra [1000:*]
1080     set xra [0:20]
1081     set x2ra [0:20/exI[1]]
1082     calstr(i) = sprintf('FM1 %-4s %3s°C X-ray: %6.4f mV/keV, σ %5.2f keV', CH, TEMP[i],
          exI[i]*mV, sxI[i]/exI[i])
1083     plot for [TT in TEMPS] fn_xrays(TT) u 1:CHI tit calstr(ix(TT)) with histeps lt ix(TT)
          lw 2, \
1084        for [i=1:N] fxI(i,x) notit with lines lt i, \
1085        Temp u (exI[$1]*75):2:(sxI[$1]) axis x1y2 title "Xray vs T" with xerrorline lw 3
          pt 7 lt 8
1086     pause plot_pause "FM1 X-ray ".CH
1087     }
1088
1089    x1 = 5
1090    x2 = 12
1091
1092    if (fit_all) {
1093
1094     set print resultfile append
1095     do for [T in TEMPS] {
1096      i = ix(T)
1097      ax=axI[i];ex=exI[i];sx=sxI[i];ba=baI[i];bs=bsI[i]
1098      fit [x1:x2] fx(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba
1099      fit [x1:x2] fx(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba, sx, bs
          , ex
1100      axI[i]=ax;exI[i]=ex;sxI[i]=sx;baI[i]=ba;bsI[i]=bs
1101      print sprintf("FM1_%s_ax_%d  = %10.6g; FM1_%s_ax_err_%d  = %10.6g # %s °C", CH, i, ax
             , CH, i, ax_err , T)
1102      print sprintf("FM1_%s_ex_%d  = %10.6g; FM1_%s_ex_err_%d  = %10.6g # %s °C", CH, i, ex
             , CH, i, ex_err , T)
1103      print sprintf("FM1_%s_sx_%d  = %10.6g; FM1_%s_sx_err_%d  = %10.6g # %s °C", CH, i, sx
             , CH, i, sx_err , T)
1104      print sprintf("FM1_%s_ba_%d  = %10.6g; FM1_%s_ba_err_%d  = %10.6g # %s °C", CH, i, ba
             , CH, i, ba_err , T)
1105      print sprintf("FM1_%s_bs_%d  = %10.6g; FM1_%s_bs_err_%d  = %10.6g # %s °C", CH, i, bs
             , CH, i, bs_err , T)
1106      set x2ra [0:20/exI[i]]
1107      replot
1108      pause plot_pause "FM1 X-ray ".CH." ".T
1109      }
1110     unset print
1111     }
1112
1113   }
1114
1115   fcI(I, x) = biC(acI[I], ecI[I], scI[I], bcaI[I], bcsI[I],  x) + 0.5
1116   fc(x)     = biC(ac,     ec,     sc,     bca,     bcs,      x) + 0.5
1117
1118   do for [CH in "B13G B23G"] {
1119
1120    eval "CHI = ".CH
1121
1122    do for [i=1:N] {
1123     eval sprintf('if(exists("FM1_%s_ex_%d")) { ecI[%d] =FM1_%s_ex_%d }',  CH, i, i, CH,
          i)
1124     eval sprintf('if(exists("FM1_%s_ac_%d")) { acI[%d] =FM1_%s_ac_%d }',  CH, i, i, CH,
          i)
1125     eval sprintf('if(exists("FM1_%s_ec_%d")) { ecI[%d] =FM1_%s_ec_%d }',  CH, i, i, CH,
          i)
1126     eval sprintf('if(exists("FM1_%s_sc_%d")) { scI[%d] =FM1_%s_sc_%d }',  CH, i, i, CH,
          i)
1127     eval sprintf('if(exists("FM1_%s_bca_%d")) { bcaI[%d] =FM1_%s_bca_%d }', CH, i, i, CH
          , i)
1128     eval sprintf('if(exists("FM1_%s_bcs_%d")) { bcsI[%d] =FM1_%s_bcs_%d }', CH, i, i, CH
```

```
        , i)
1129    }
1130
1131    if (plot_all) {
1132    @DEFAULTS
1133    set yra [10:*]
1134    set xra [0:60]
1135    set x2ra [0:60/ecI[1]]
1136    calstr(i) = sprintf('FM1 %-4s %3s°C Compton: %6.4f mV/keV, σ %5.2f keV', CH, TEMP[i],
          ecI[i]*mV, scI[i]/ecI[i])
1137    plot for [TT in TEMPS] fn_xrays(TT) u 1:CHI tit calstr(ix(TT)) with histeps lt ix(TT)
          lw 2, \
1138       for [i=1:N] fcI(i,x) notit with lines lt i, \
1139       Temp u (ecI[$1]*393):2:(scI[$1]) axis x1y2 title "Compton Edge vs T" with
          xerrorline lw 3 pt 7 lt 8
1140    pause plot_pause "FM1 Compton ".CH
1141    }
1142
1143    x1 = 25
1144    x2 = 40
1145
1146    if (fit_all) {
1147
1148    set print resultfile append
1149    do for [T in TEMPS] {
1150     i = ix(T)
1151     ac=acI[i];ec=ecI[i];sc=scI[i];bca=bcaI[i];bcs=bcsI[i]
1152     fit [x1:x2] fc(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca, bcs
1153     fit [x1:x2] fc(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca, bcs,
          ec, sc
1154     acI[i]=ac;ecI[i]=ec;scI[i]=sc;bcaI[i]=bca;bcsI[i]=bcs
1155     print sprintf("FM1_%s_ac_%d  = %10.6g; FM1_%s_ac_err_%d  = %10.6g # %s °C", CH, i, ac
          , CH, i, ac_err, T)
1156     print sprintf("FM1_%s_ec_%d  = %10.6g; FM1_%s_ec_err_%d  = %10.6g # %s °C", CH, i, ec
          , CH, i, ec_err, T)
1157     print sprintf("FM1_%s_sc_%d  = %10.6g; FM1_%s_sc_err_%d  = %10.6g # %s °C", CH, i, sc
          , CH, i, sc_err, T)
1158     print sprintf("FM1_%s_bca_%d = %10.6g; FM1_%s_bca_err_%d = %10.6g # %s °C", CH, i,
          bca, CH, i, bca_err, T)
1159     print sprintf("FM1_%s_bcs_%d = %10.6g; FM1_%s_bcs_err_%d = %10.6g # %s °C", CH, i,
          bcs, CH, i, bcs_err, T)
1160     set x2ra [0:60/ecI[i]]
1161     replot
1162     pause plot_pause "FM1 Compton ".CH." ".T
1163     }
1164    unset print
1165    }
1166
1167   }
1168
1169   if (!exist("FM1_Bx3G_ee0")) { FM1_Bx3G_ee0 = 0.101327 }
1170   if (!exist("FM1_Bx3G_ee1")) { FM1_Bx3G_ee1 = 2.15528e-05 }
1171
1172   if (plot_all) {
1173    @DEFAULTS
1174    set xra [*:*]
1175    set yra [0.084:0.094]
1176    set xlab "Temperature"
1177    set format x "%.0f°C"
1178    unset log
1179    calstr(i) = sprintf('FM1 Bx3G (%.4f + %.1f ppm/°C × T) mV/keV', FM1_Bx3G_ee0,
          FM1_Bx3G_ee1*1e6)
1180    plot for [l in "x c"] "<awk '/_B.3G_e".l."_/;/_a[cx]_1/{print Nix}' ".resultfile u
          8:3:6 tit "e".l w errorline, \
1181       FM1_Bx3G_ee0+FM1_Bx3G_ee1*x tit calstr(1) with l lw 3
1182    pause plot_pause "FM1 Bx3G"
1183   }
1184
1185   if (fit_all) {
1186    fit [] [0.084:0.094] FM1_Bx3G_ee0+FM1_Bx3G_ee1*x "<awk '/_B.3G_e[xc]_/' ".resultfile u
          8:3:6 zerror via FM1_Bx3G_ee0,FM1_Bx3G_ee1
1187    set print resultfile append
1188    print sprintf("FM1_Bx3G_ee0  = %10.6g; FM1_Bx3G_ee0_err  = %10.6g", FM1_Bx3G_ee0,
          FM1_Bx3G_ee0_err)
1189    print sprintf("FM1_Bx3G_ee1  = %10.6g; FM1_Bx3G_ee1_err  = %10.6g", FM1_Bx3G_ee1,
          FM1_Bx3G_ee1_err)
1190    unset print
1191    replot
1192    pause plot_pause "FM1 Bx3G"
1193   }
1194
1195   e_avg(CH) = 0+system('./HETEPT.awk 2>/dev/null "/FM1_'.CH.'_e[x]_/{do_AVG(\$3, 1/(\$6/\
```

```
        $8)**2, \"'.CH.'\")};END{AVG(\"'.CH.'\");print AVG_m}" '.resultfile)
1196
1197  print sprintf("FM1_B3_TC = 1.0 / (1%+.4g*T_HET1)", FM1_Bx3G_ee1/FM1_Bx3G_ee0)
1198  do for [CH in "B13G B23G"] {
1199      e_b3 = e_avg(CH)
1200      print sprintf("FM1_%s_calib = %.3f * FM1_B3_TC", CH, 1/mV/e_b3)
1201  }
1202
1203  # HET gain ratio  ##############################################################
1204
1205  ratio = 14
1206
1207  HL_chs = "A11L A12L A21L A22L B11L B12L B21L B22L"
1208  HL_chN = words(HL_chs)
1209  HL_ch(ci) = word(HL_chs, ci)
1210
1211  do for [ci=1:HL_chN] {
1212   CH= HL_ch(ci)
1213   eval "CHI = ".CH
1214
1215   do for [i=1:N] { eI[i]=ratio }
1216   do for [i=1:N] { eval sprintf('if(exists("FM1_%s_ratio_%d")) { eI[%d]=FM1_%s_ratio_%d }
         ', CH, i, i, CH, i) }
1217   do for [i=1:N] { eval sprintf('if(exists("FM1_%s_ratio_err_%d")) { eI_err[%d]=FM1_%
         s_ratio_err_%d }', CH, i, i, CH, i) }
1218
1219   if (plot_all) {
1220    @DEFAULTS
1221    set xra [500:10000]
1222    set yra [*:*]
1223    unset log y
1224    set log x
1225    set x2ra [*:*]
1226    set format x2 "%.1f°C"
1227    set y2lab "Temperature"
1228    calstr(i) = sprintf('FM1 %s %3s°C ratio %.2f', CH, TEMP[i], eI[i])
1229    plot for [TT in TEMPS] "<grep ".CH." ".fn_abhl(TT) u 4:($5/$4) notit with p lt ix(TT)
        pt 2 ps 0.9, \
1230        for [i=1:N] 1.0/eI[i] tit calstr(i) with lines lt i lw 2, \
1231        Temp u 2:(1.0/eI[$1]) axis x2y1 not with lp lt 8 pt 7
1232    pause plot_pause "FM1 ".CH
1233   }
1234
1235   if (fit_all) {
1236    set print resultfile append
1237    do for [T in TEMPS] {
1238     i = ix(T)
1239     e = eI[i]
1240     fit [500:10000] [*:*]  x/e "<grep ".CH." ".fn_abhl(T) u 4:5:(1.0/$4) zerror via e
1241     eI[i]=e; eI_err[i]=e_err
1242     print sprintf("FM1_%s_ratio_%d  = %10.6g; FM1_%s_ratio_err_%d  = %10.6g # %s °C %d",
          CH, i, e, CH, i, e_err, T, ci)
1243     replot
1244     pause plot_pause "FM1 ".CH." ".T
1245    }
1246    unset print
1247   }
1248  }
1249
1250  # HET High/Low TC ##############################################################
1251
1252  do for [i=1:30] { ee0[i]=14;  ee1[i]=1.0;  ee2[i]=1.0; }
1253
1254  v(ci, v) = "FM1_".HL_ch(ci)."_".v
1255
1256  do for [ci=1:HL_chN] {
1257   if (exist(v(ci,'ee0'))) { eval "ee0[".ci."] = ".v(ci,'ee0') }
1258   if (exist(v(ci,'ee1'))) { eval "ee1[".ci."] = ".v(ci,'ee1') }
1259   if (exist(v(ci,'ee2'))) { eval "ee2[".ci."] = ".v(ci,'ee2') }
1260  }
1261
1262  fn_hl_cal(c) = "<awk '/_ratio_1/{print Nix};/FM1_".c."_ratio/' ".resultfile
1263  f_hl_cal(ci, t) =  ee0[ci]*(1 + t*(ee1[ci]/100 + ee2[ci]/1e6*t))
1264
1265  if (plot_all) {
1266    @DEFAULTS
1267    set xra [*:*]
1268    set yra [*:*]
1269    set xlab "Temperature"
1270    set format x "%.0f°C"
1271    unset log
1272    calstr(i) = sprintf('FM1 %s %.4f×(1 %+.3g %%/°C T %+.3g pp/°C² T²) mV/keV', HL_ch(i),
```

```
        ee0[i], ee1[i], ee2[i])
1273    plot for [cii=1:HL_chN] fn_hl_cal(HL_ch(cii)) u 8:3:6 notit w errorline lt cii pt 7, \
1274         for [cii=1:HL_chN] f_hl_cal(cii, x) tit calstr(cii) with l lt cii lw 3
1275    pause plot_pause "FM1 HL TC"
1276  }
1277
1278  if (fit_all) {
1279   do for [ci=1:HL_chN] {
1280    CH=HL_ch(ci)
1281    e0=ee0[ci]; e1=ee1[ci]; e2=ee2[ci]
1282    fit e0*(1 + x*(e1/100 + e2/1e6*x)) fn_hl_cal(CH) u 8:3:6 zerror via e0,e1,e2
1283    ee0[ci]=e0; ee1[ci]=e1; ee2[ci]=e2
1284    set print resultfile append
1285    print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee0'), e0, v(ci,'ee0'), e0_err)
1286    print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee1'), e1, v(ci,'ee1'), e1_err)
1287    print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee2'), e2, v(ci,'ee2'), e2_err)
1288    unset print
1289    replot
1290    pause plot_pause "FM1 HL TC ".CH
1291   }
1292  }
1293
1294  if (!exist("FM1_HL_e0")) { FM1_HL_e0=1;  FM1_HL_e1=1; FM1_HL_e2=1 }
1295  f(t) = FM1_HL_e0*(1 + t*(FM1_HL_e1/100 + FM1_HL_e2/1e6*t))
1296
1297  if (plot_all) {
1298    @DEFAULTS
1299    set xra [*:*]
1300    set yra [*:*]
1301    set xlab "Temperature"
1302    set format x "%.0f°C"
1303    unset log
1304    calstr(i) = sprintf('FM1 HL %.4f×(1 %+.2g %%/°C T %+.2g ppm/°C² T²) mV/keV', FM1_HL_e0
        , FM1_HL_e1, FM1_HL_e2)
1305    plot for [cii=1:HL_chN] fn_hl_cal(HL_ch(cii)) u 8:($3/ee0[$10]):($6*1e2) tit HL_ch(cii
        ) w errorline lt cii pt 2, \
1306         f(x) tit calstr(1) with l lt 9 lw 3
1307    pause plot_pause "FM1 HL TC"
1308  }
1309
1310  if (fit_all) {
1311    fit f(x) fn_hl_cal('[AB][12][12]L') u 8:($3/ee0[$10]):6 zerror via FM1_HL_e0,
         FM1_HL_e1, FM1_HL_e2
1312    set print resultfile append
1313    print sprintf("FM1_HL_e0 = %10.6g; FM1_HL_e0_err = %10.6g", FM1_HL_e0, FM1_HL_e0_err)
1314    print sprintf("FM1_HL_e1 = %10.6g; FM1_HL_e1_err = %10.6g", FM1_HL_e1, FM1_HL_e1_err)
1315    print sprintf("FM1_HL_e2 = %10.6g; FM1_HL_e2_err = %10.6g", FM1_HL_e2, FM1_HL_e2_err)
1316    unset print
1317    replot
1318    pause plot_pause "FM1 HL TC"
1319  }
1320
1321  print sprintf("FM1_HET_HL_TC = 1.0 / (1 + T_HET1*(%.4g %+.4g*T_HET1))", FM1_HL_e1/100,
       FM1_HL_e2/1e6)
1322  do for [ci=1:HL_chN] {
1323      CH=HL_ch(ci)
1324      print sprintf("FM1_%s_calib = FM1_%sH_calib * %.3f * FM1_HET_HL_TC", CH, CH[1:3],
       ee0[ci])
1325  }
1326
1327  #
       ##############################################################################################################

1328
1329  unset out
1330  set term pop
1331  unset print
```

3.8 FM2 Script

```
#! /usr/local/bin/gnuplot
# -*- gnuplot -*-

# (replace-regexp "^\\([a-zA-Z_0-9]+\\)\\( *\\) = \\([0-9.e+-]+ *\\)      \\+/- \\([0-9.e+-]+ *\\) (.*)$" "\\1\\2 = \\3 ; \\1_err\\2 = \\4" nil (if (and transient-mark-mode mark-active) (region-beginning)) (if (and transient-mark-mode mark-active) (region-end)) nil)

# (replace-regexp "^\\( *if (\\)1\\+\\(plot_all\\|fit_all\\)" "\\1\\2" nil (if (and transient-mark-mode mark-active) (region-beginning)) (if (and transient-mark-mode mark-active) (region-end)) nil)

# Paste gnuplot fit "Final set of parameters" into this file.
# In Emacs, place cursor in the empty line above and type: C-x C-e.

reset
unset print

fn_base = "2016-10-13-fm2-tvcal"
set title fn_base."-calibration" noenh

fn_xrays(T) = "data/".fn_base."-x_".T."°C_xrays.hist"
fn_bb_c(T) = "data/".fn_base."-x_".T."°C_BB_C.1dhist"
fn_bb(T) = "data/".fn_base."-x_".T."°C.bb_itf"
fn_bgo(T) = "data/".fn_base."-x_".T."°C.BGO"
fn_abhl(T) = "data/".fn_base."-x_".T."°C.ABHL"

fit_all = 0
plot_all = fit_all
plot_pause = 0

fitlogfile = fn_base."-calibration.fit"
resultfile = fn_base."-calibration.results"

if (ARG1 eq "fit") {
  fit_all = 1
  plot_all = 1
  system("rm -f ".fitlogfile)
  if (ARG2 eq "pause") {
   plot_pause = -1
  }
  if (ARG2 eq "dumb") {
   set term dumb
  }
}

set fit logfile fitlogfile
set fit results

if (ARG1[1:4] eq "plot") {
  reset
  fit_all = 0
  plot_all = 1
  if (ARG1 eq "plotthis") {plot_all = 0}
  plot_pause = 0
  plotext = ARG2[strlen(ARG2)-2:]
  if (plotext eq "png") {
   set out ARG2
   set term png size 1200,900
  }
  if (plotext eq ".ps") {
   set out ARG2
   set term postscript enhanced solid color
  }
  if (plotext eq "pdf") {
   set out ARG2
   set term pdf size 11.6in,8.2in
   set lmargin at screen 0.075
   set rmargin at screen 0.925
   set tmargin at screen 0.075
   set bmargin at screen 0.90
  }
}
if (ARG1 eq "print") {
  fit_all = 0
  plot_all = 0
  set print ARG2
}
if (ARG1[1:5] eq "pause") {
  fit_all = 0
```

```
76      plot_all = 1
77      if (ARG1 eq "pausethis") {plot_all = 0}
78      plot_pause = -1
79      if (ARG2 ne "") {
80        plot_pause = ARG2+0
81      }
82    }
83
84    load resultfile
85    if (fit_all) {
86      system("mv ".resultfile." ".resultfile."~")
87      set print resultfile
88      print "# `date`"
89      unset print
90    }
91
92    I=2
93    mV = 9.772
94
95    C4=I+22
96    A3=I+25
97    C3=I+24
98    A4=I+23
99    C2=I+26
100   A1=I+29
101   C1=I+28
102   A2=I+27
103
104   A11L=I+ 8
105   A11H=I+ 6
106   A12L=I+ 9
107   A12H=I+21
108
109   B11L=I+ 0
110   B11H=I+ 1
111   B12L=I+ 3
112   B12H=I+ 2
113   B13G=I+ 7
114
115   A21L=I+17
116   A21H=I+16
117   A22L=I+14
118   A22H=I+15
119
120   B21L=I+10
121   B21H=I+11
122   B22L=I+12
123   B22H=I+13
124   B23G=I+19
125
126   C1L=I+4
127   C1H=I+5
128   C2L=I+20
129   C2H=I+18
130
131   set samples 10000
132   set fit errorvar noerrorscaling
133
134   pk(a,e,s, x) = a*exp(-((x-e)/s)**2/2)
135   bg(a,e,s, x) = a*exp(-(x-e)/s)
136
137   keV75 = 74.969 # X-ray
138   keV73 = 72.805 # X-ray
139   keV84 = 84.45
140   keV85 = 84.938
141   keV87 = 87.3
142   keV58 = 57.962 # Comptom backscatter
143   keV57 = 56.660 # Comptom backscatter
144   keV393 = 393.306  # Comptom edge
145   keV858 = 857.6427 # Comptom edge
146   biX2(a,e,s, x) = pk(a*4.31,e*keV84,s, x) + pk(a*8.27,e*keV85,s, x)  + pk(a*3.02,e*keV87,
          s, x)
147   biB(a,e,s, ba,bs, x) = bg(ba,e*keV58,bs, x) + pk(a*35.7,e*keV58,s, x) + pk(a*23.7, e*
          keV57,s, x)
148   biX(a,e,s, ba,bs, x) = bg(ba,e*keV75,bs, x) + pk(a*35.7,e*keV75,s, x) + pk(a*23.7, e*
          keV73,s, x) + biX2(a*0.65,e,s, x)
149   biXB(a,e,s, ab,eb,sb, ba,bs, x) = biX(a,e,s, ba,bs, x) + biB(ab,eb,sb, 0,1, x)
150   CEdge(a,e,s, ba,bs, x) = bg(ba,e,bs, x)*(1+a/2/ba*erf(-(x-e)/s))
151   biC(a,e,s, ba,bs, x) = bg(ba,e*keV393,bs, x)*(1+a/2/ba*erf(-(x-e*keV393)/s))
152   biC2(a,e,s, ba,bs, x) = bg(ba,e*keV858,bs, x)*(1+a/2/ba*erf(-(x-e*keV858)/s))
153
154   keV482  = 481.6935 # conversion e-
155   keV554  = 553.8372 # conversion e-
```

```
156  keV566  = 565.8473 # conversion e-
157  keV976  = 975.651  # conversion e-
158  keV1048 = 1047.795 # conversion e-
159  keV1060 = 1059.805 # conversion e-
160  CE(keV, e1,e2, x) = e2*keV - e2/e1*x
161  biE1(a,aa,e,s, ba,bs, x) = bg(ba,e*keV482,bs, x) + pk(a*1.537,e*keV482,s, x) + pk(aa*a
         *0.442, e*keV554, s, x) + pk(aa*a*0.111, e*keV566,s, x)
162  biE2(a,aa,e,s, ba,bs, x) = bg(ba,e*keV976,bs, x) + pk(a*7.08, e*keV976,s, x) + pk(aa*a
         *1.84,  e*keV1048,s, x) + pk(aa*a*0.44, e*keV1060,s, x)
163
164  landau(l)=sqrt(exp(-l-exp(-l))/2/pi)
165  mips(a,e,s, x)=a*landau((x-e)/s)
166  tail_e = 2.5
167  tail_s = 2.5
168  tail_N(w,s) = 2*s*exp((w/(2*s))**2) # integrate(exp(-x/s)*(1+erf(x/w)), x)
169  tail(a,e,w,s, x) = a/(2*s*exp((w/(2*s))**2))*(1+erf((x-e)/w))*exp(-(x-e)/s)
170  mips_tail(a,e,s, ta,ts, x)=mips(a,e,s, x) + tail(ta, e+tail_e*s, s*tail_s, ts, x)
171
172  keV_ABBA = 18.024*1000
173
174  TEMPS = "-7 +7 +19 +33 +42 +44"
175  N = words(TEMPS)
176  array TEMP[N]
177  do for [i=1:N] { TEMP[i] = word(TEMPS, i); }
178  s = "ix(T) ="
179  do for [i=1:N] { s = s . sprintf(" T==TEMP[%d] ? %d :",i,i) }
180  s = s." 0"
181  eval s
182
183  array Temp[N]
184  do for [i=1:N] {
185    T=TEMP[i]
186    eval system(sprintf('awk "/%s°C/{print \"Temp[%d]=\" \$7;exit}" %s*.avg_temp', T, i,
         fn_base))
187  }
188
189  DEFAULTS = "set log y;unset log x;set x2tics;set xtics nomirror;set ytics nomirror;" \
190  . "set xlab 'pulse height [mV]';set x2lab 'pulse height [keV]';" \
191  . "set y2tics;unset format; set format y2 '%.0f°C'"
192  @DEFAULTS
193
194  array axI[N]
195  array exI[N]
196  array sxI[N]
197  array abI[N]
198  array baI[N]
199  array bsI[N]
200  array acI[N]
201  array ecI[N]
202  array scI[N]
203  array bcaI[N]
204  array bcsI[N]
205  array aI[N]
206  array eI[N]
207  array sI[N]
208  array eI_err[N]
209  array ee0[30]
210  array ee1[30]
211  array ee2[30]
212
213
214  # EPT X-rays  ##############################################################
215
216  ax  = 444.684
217  ex  = 0.100482
218  sx  = 0.280512
219  ba  = 1586.18
220  bs  = 3.25276
221  bca = 242.717
222  bcs = 15.7392
223  ac  = 282.445
224  ec  = 0.10187
225  sc  = 0.825364
226  ab  = 5
227
228  do for [i=1:N] {
229  axI[i]  = ax
230  exI[i]  = ex
231  sxI[i]  = sx
232  abI[i]  = ab
233  baI[i]  = ba
234  bsI[i]  = bs
```

```
235  bcaI[i] = bca
236  bcsI[i] = bcs
237  acI[i]  = ac
238  ecI[i]  = ec
239  scI[i]  = sc
240  }
241
242  EPT_chs = "C1 C2 C3 C4 A1 A2 A3 A4"
243  EPT_chN = words(EPT_chs)
244  EPT_ch(ci) = word(EPT_chs, ci)
245
246
247  fI(I, x) = biXB(axI[I], exI[I], sxI[I], axI[I]/5, exI[I]*1.05, exI[I]*6, baI[I], bsI[I],
         x) + 0.5
248  f(x)     = biXB(ax,     ex,     sx,     ax/5,     ex*1.05,     ex*6,     ba,     bs,
         x) + 0.5
249
250  do for [ci=1:EPT_chN] {
251   CH=EPT_ch(ci)
252   eval "CHI = ".CH
253
254   do for [i=1:N] {
255    eval sprintf('if(exists("FM2_%s_ax_%d")) { axI[%d] =FM2_%s_ax_%d }', CH, i, i, CH, i
         )
256    eval sprintf('if(exists("FM2_%s_ex_%d")) { exI[%d] =FM2_%s_ex_%d }', CH, i, i, CH, i
         )
257    eval sprintf('if(exists("FM2_%s_sx_%d")) { sxI[%d] =FM2_%s_sx_%d }', CH, i, i, CH, i
         )
258    eval sprintf('if(exists("FM2_%s_ba_%d")) { baI[%d] =FM2_%s_ba_%d }', CH, i, i, CH, i
         )
259    eval sprintf('if(exists("FM2_%s_bs_%d")) { bsI[%d] =FM2_%s_bs_%d }', CH, i, i, CH, i
         )
260   }
261   if (plot_all) {
262    @DEFAULTS
263    set yra [100:*]
264    set xra [0:20]
265    set x2ra [0:20/exI[1]]
266    calstr(i) = sprintf('FM2 %-4s %3s°C X-ray: %6.4f mV/keV, σ %5.2f keV', CH, TEMP[i],
         exI[i]*mV, sxI[i]/exI[i])
267    plot for [TT in TEMPS] fn_xrays(TT) u 1:CHI tit calstr(ix(TT)) with histeps lt ix(TT)
         lw 2, \
268       for [i=1:N] fI(i,x) notit with lines lt i, \
269       Temp u (exI[$1]*75):2:(sxI[$1]) axis x1y2 title "Xray vs T" with xerrorline lw 3
         pt 7 lt 8
270    pause plot_pause "FM2 X-rays ".CH
271    }
272
273   x1 = 4
274   x2 = 12
275   y1 = 100
276   if (CH[1:1] eq 'A') { y1 = 700 }
277
278   if (fit_all) {
279    set print resultfile append
280    do for [T in TEMPS] {
281     i = ix(T)
282     ax=axI[i];ex=exI[i];sx=sxI[i];ab=abI[i];ba=baI[i];bs=bsI[i]
283     fit [x1:x2] [y1:*] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba,
           bs
284     fit [x1:x2] [y1:*] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba,
          sx, bs, ex
285     axI[i]=ax;exI[i]=ex;sxI[i]=sx;abI[i]=ab;baI[i]=ba;bsI[i]=bs
286     print sprintf("FM2_%s_ax_%d  = %10.6g; FM2_%s_ax_err_%d  = %10.6g # %s °C %d", CH, i,
         ax, CH, i, ax_err, T, ci)
287     print sprintf("FM2_%s_ex_%d  = %10.6g; FM2_%s_ex_err_%d  = %10.6g # %s °C %d", CH, i,
         ex, CH, i, ex_err, T, ci)
288     print sprintf("FM2_%s_sx_%d  = %10.6g; FM2_%s_sx_err_%d  = %10.6g # %s °C %d", CH, i,
         sx, CH, i, sx_err, T, ci)
289     print sprintf("FM2_%s_ba_%d  = %10.6g; FM2_%s_ba_err_%d  = %10.6g # %s °C %d", CH, i,
         ba, CH, i, ba_err, T, ci)
290     print sprintf("FM2_%s_bs_%d  = %10.6g; FM2_%s_bs_err_%d  = %10.6g # %s °C %d", CH, i,
         bs, CH, i, bs_err, T, ci)
291     set x2ra [0:20/exI[i]]
292     replot
293     pause plot_pause "FM2 X-rays ".CH." ".T."°C"
294     }
295    unset print
296   }
297  }
298
299  # EPT Compton edge ###########################################################
```

```
300
301  fI(I, x) = biC(acI[I], ecI[I], scI[I], bcaI[I], bcsI[I],  x) + 0.5
302  f(x)     = biC(ac,     ec,     sc,     bca,     bcs,      x) + 0.5
303
304  do for [ci=1:EPT_chN] {
305   CH=EPT_ch(ci)
306   eval "CHI = ".CH
307
308   do for [i=1:N] {
309    eval sprintf('if(exists("FM2_%s_bca_%d")) { bcaI[%d]=FM2_%s_bca_%d }', CH, i, i, CH, i
       )
310    eval sprintf('if(exists("FM2_%s_bcs_%d")) { bcsI[%d]=FM2_%s_bcs_%d }', CH, i, i, CH, i
       )
311    eval sprintf('if(exists("FM2_%s_ac_%d"))  { acI[%d] =FM2_%s_ac_%d }',  CH, i, i, CH, i
       )
312    eval sprintf('if(exists("FM2_%s_ec_%d"))  { ecI[%d] =FM2_%s_ec_%d }',  CH, i, i, CH, i
       )
313    eval sprintf('if(exists("FM2_%s_sc_%d"))  { scI[%d] =FM2_%s_sc_%d }',  CH, i, i, CH, i
       )
314   }
315   if (plot_all) {
316    @DEFAULTS
317    set yra [1:*]
318    set xra [20:60]
319    set x2ra [0:60/ecI[1]]
320    calstr(i) = sprintf('FM2 %-4s %3s°C Compton: %6.4f mV/keV, σ %5.2f keV', CH, TEMP[i],
         ecI[i]*mV, scI[i]/ecI[i])
321    plot for [TT in TEMPS] fn_xrays(TT) u 1:CHI tit calstr(ix(TT)) with histeps lt ix(TT)
         lw 2, \
322         for [i=1:N] fI(i,x) notit with lines lt i, \
323         Temp u (ecI[$1]*393):2 axis x1y2 title "Compton vs T" with lp lw 3 pt 7 lt 8
324    pause plot_pause "FM2 Compton ".CH
325    }
326
327   x1 = 20
328   x2 = 50
329
330   if (fit_all) {
331    set print resultfile append
332    do for [T in TEMPS] {
333     i = ix(T)
334     bca=bcaI[i];bcs=bcsI[i];ac=acI[i];ec=ecI[i];sc=scI[i];
335     fit [x1:x2] [*:*] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca
336     fit [x1:x2] [*:*] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca,
           bcs, ec
337     fit [x1:x2] [*:*] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca,
         sc, bcs, ec
338     bcaI[i]=bca;bcsI[i]=bcs;acI[i]=ac;ecI[i]=ec;scI[i]=sc;
339     print sprintf("FM2_%s_bca_%d = %10.6g; FM2_%s_bca_err_%d = %10.6g # %s °C %d", CH, i,
         bca, CH, i, bca_err, T, ci)
340     print sprintf("FM2_%s_bcs_%d = %10.6g; FM2_%s_bcs_err_%d = %10.6g # %s °C %d", CH, i,
         bcs, CH, i, bcs_err, T, ci)
341     print sprintf("FM2_%s_ac_%d  = %10.6g; FM2_%s_ac_err_%d  = %10.6g # %s °C %d", CH, i,
         ac , CH, i, ac_err , T, ci)
342     print sprintf("FM2_%s_ec_%d  = %10.6g; FM2_%s_ec_err_%d  = %10.6g # %s °C %d", CH, i,
         ec , CH, i, ec_err , T, ci)
343     print sprintf("FM2_%s_sc_%d  = %10.6g; FM2_%s_sc_err_%d  = %10.6g # %s °C %d", CH, i,
         sc , CH, i, sc_err , T, ci)
344     set x2ra [0:60/ecI[i]]
345     replot
346     pause plot_pause "FM2 Compton ".CH." ".T."°C"
347     }
348    unset print
349   }
350
351  }
352
353  # EPT Gain TC ##############################################################
354
355  do for [i=1:30] { ee0[i]=1.0;  ee1[i]=1.0;  ee2[i]=1.0; }
356
357  v(ci, v) = "FM2_".EPT_ch(ci)."_".v
358
359  do for [ci=1:EPT_chN] {
360   if (exist(v(ci,'ee0'))) { eval "ee0[".ci."] = ".v(ci,'ee0') }
361   if (exist(v(ci,'ee1'))) { eval "ee1[".ci."] = ".v(ci,'ee1') }
362   if (exist(v(ci,'ee2'))) { eval "ee2[".ci."] = ".v(ci,'ee2') }
363  }
364
365  fn_ept_cal(c, l) = "<awk '/_".c."_e".l."_/;/_a[cx]_1/{print Nix}' ".resultfile
366  f_ept_cal(ci, t) =  ee0[ci]*(1 + t*(ee1[ci]/100 + ee2[ci]/1e6*t))
367
```

```
368 if (plot_all) {
369   @DEFAULTS
370   set xra [*:*]
371   set yra [*:*]
372   set xlab "Temperature"
373   set format x "%.0f°C"
374   unset log
375   calstr(i) = sprintf('FM2 %s %.4f×(1 %+.3g %%/°C T %+.3g pp/°C² T²) mV/keV', EPT_ch(i),
          ee0[i], ee1[i], ee2[i])
376   plot for [cii=1:EPT_chN] fn_ept_cal(EPT_ch(cii), 'x') u 8:3:6 notit w errorline lt cii
          pt 2, \
377        for [cii=1:EPT_chN] fn_ept_cal(EPT_ch(cii), 'c') u 8:3:6 notit w errorline lt cii
          pt 6, \
378        for [cii=1:EPT_chN] f_ept_cal(cii, x) tit calstr(cii) with l lt cii lw 3
379   pause plot_pause "FM2 EPT TC"
380 }
381
382 if (fit_all) {
383  do for [ci=1:EPT_chN] {
384   CH=EPT_ch(ci)
385   e0=ee0[ci]; e1=ee1[ci]; e2=ee2[ci]
386   fit e0*(1 + x*(e1/100 + e2/1e6*x)) fn_ept_cal(CH, '[cx]') u 8:3:6 zerror via e0,e1,e2
387   ee0[ci]=e0; ee1[ci]=e1; ee2[ci]=e2
388   set print resultfile append
389   print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee0'), e0, v(ci,'ee0'), e0_err)
390   print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee1'), e1, v(ci,'ee1'), e1_err)
391   print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee2'), e2, v(ci,'ee2'), e2_err)
392   unset print
393   replot
394   pause plot_pause "FM2 EPT TC ".CH
395  }
396 }
397
398 if (!exist("FM2_EPT_e0")) { FM2_EPT_e0=1;  FM2_EPT_e1=1; FM2_EPT_e2=1 }
399 f(t) = FM2_EPT_e0*(1 + t*(FM2_EPT_e1/100 + FM2_EPT_e2/1e6*t))
400
401 if (plot_all) {
402   @DEFAULTS
403   set xra [*:*]
404   set yra [*:*]
405   set xlab "Temperature"
406   set format x "%.0f°C"
407   unset log
408   calstr(i) = sprintf('FM2 EPT %.4f×(1 %+.2g %%/°C T %+.2g ppm/°C² T²) mV/keV',
          FM2_EPT_e0, FM2_EPT_e1, FM2_EPT_e2)
409   plot for [cii=1:EPT_chN] fn_ept_cal(EPT_ch(cii), 'x') u 8:($3/ee0[$10]):6 tit EPT_ch(
          cii) w errorline lt cii pt 2, \
410        for [cii=1:EPT_chN] fn_ept_cal(EPT_ch(cii), 'c') u 8:($3/ee0[$10]):6 notit
           w errorline lt cii pt 6, \
411        f(x) tit calstr(1) with l lt 8 lw 3
412   pause plot_pause "FM2 EPT TC"
413 }
414
415 if (fit_all) {
416   fit f(x) fn_ept_cal('[CA][1234]', '[cx]') u 8:($3/ee0[$10]):6 zerror via FM2_EPT_e0,
          FM2_EPT_e1, FM2_EPT_e2
417   set print resultfile append
418   print sprintf("FM2_EPT_e0 = %10.6g; FM2_EPT_e0_err = %10.6g", FM2_EPT_e0,
          FM2_EPT_e0_err)
419   print sprintf("FM2_EPT_e1 = %10.6g; FM2_EPT_e1_err = %10.6g", FM2_EPT_e1,
          FM2_EPT_e1_err)
420   print sprintf("FM2_EPT_e2 = %10.6g; FM2_EPT_e2_err = %10.6g", FM2_EPT_e2,
          FM2_EPT_e2_err)
421   unset print
422   replot
423   pause plot_pause "FM2 EPT TC"
424 }
425
426 print sprintf("FM2_EPT_TC = 1.0 / (1 + T_HET1*(%.4g %+.4g*T_HET1))", FM2_EPT_e1/100,
        FM2_EPT_e2/1e6)
427 do for [ci=1:EPT_chN] {
428     CH=EPT_ch(ci)
429     print sprintf("FM2_%s_calib = %.3f * FM2_EPT_TC", CH, 1/mV/ee0[ci])
430 }
431
432 # C1H Xrays and Compton edge
        ###########################################################
433
434 ex      = 0.620193 *43.8/45.8
435 ec      = ex
436
437 biXI(I,x) = biXB(axI[I], exI[I], sxI[I], abI[I], exI[I]*1.05, exI[I]*6, baI[I], bsI[I],
        x)
```

```
438  biCI(I,x) =  biC(acI[I], ecI[I], scI[I], bcaI[I], bcsI[I],  x)
439  fI(I, x) = biXI(I, x) + biCI(I, x) + 0.5
440  f(x) =  biXB(ax, ex, sx, ab, ex*1.05, ex*6, ba, bs,  x) + biC(ac, ec, sc, bca, bcs,  x)
         + 0.5
441
442  do for [i=1:N] {
443   axI[i]  = ax
444   exI[i]  = ex
445   sxI[i]  = sx
446   abI[i]  = ab
447   baI[i]  = ba
448   bsI[i]  = bs
449   bcaI[i] = bca
450   bcsI[i] = bcs
451   acI[i]  = ac
452   ecI[i]  = ec
453   scI[i]  = sc
454  }
455
456  do for [CH in "C1H"] {
457
458   eval "CHI = ".CH
459
460   do for [i=1:N] {
461    eval sprintf('if(exists("FM2_%s_ax_%d")) { axI[%d] =FM2_%s_ax_%d }', CH, i, i, CH, i
         )
462    eval sprintf('if(exists("FM2_%s_ex_%d")) { exI[%d] =FM2_%s_ex_%d }', CH, i, i, CH, i
         )
463    eval sprintf('if(exists("FM2_%s_sx_%d")) { sxI[%d] =FM2_%s_sx_%d }', CH, i, i, CH, i
         )
464    eval sprintf('if(exists("FM2_%s_ab_%d")) { abI[%d] =FM2_%s_ab_%d }', CH, i, i, CH, i
         )
465    eval sprintf('if(exists("FM2_%s_ba_%d")) { baI[%d] =FM2_%s_ba_%d }', CH, i, i, CH, i
         )
466    eval sprintf('if(exists("FM2_%s_bs_%d")) { bsI[%d] =FM2_%s_bs_%d }', CH, i, i, CH, i
         )
467    eval sprintf('if(exists("FM2_%s_bca_%d")) { bcaI[%d]=FM2_%s_bca_%d }', CH, i, i, CH, i
         )
468    eval sprintf('if(exists("FM2_%s_bcs_%d")) { bcsI[%d]=FM2_%s_bcs_%d }', CH, i, i, CH, i
         )
469    eval sprintf('if(exists("FM2_%s_ac_%d")) { acI[%d] =FM2_%s_ac_%d }', CH, i, i, CH, i
         )
470    eval sprintf('if(exists("FM2_%s_ec_%d")) { ecI[%d] =FM2_%s_ec_%d }', CH, i, i, CH, i
         )
471    eval sprintf('if(exists("FM2_%s_sc_%d")) { scI[%d] =FM2_%s_sc_%d }', CH, i, i, CH, i
         )
472   }
473
474   if (plot_all) {
475    @DEFAULTS
476    set yra [10:10000]
477    set xra [0:300]
478    set x2ra [0:300/exI[1]]
479    calstr(i) = sprintf('FM2 %-4s %3s°C X-ray: %6.4f mV/keV, σ %5.2f keV, C: %6.4f mV/keV,
         σ %5.2f keV', \
480      CH, TEMP[i], exI[i]*mV, sxI[i]/exI[i], ecI[i]*mV, scI[i]/ecI[i])
481    plot for [TT in TEMPS] fn_xrays(TT) u 1:CHI tit calstr(ix(TT)) with histeps lt ix(TT)
         lw 2, \
482       for [ii=1:N] fI(ii,x) notit with lines lt ii, \
483       Temp u (ecI[$1]*393):2 axis x1y2 title "Compton vs T" with lp lw 3 pt 7 lt 7, \
484       Temp u (exI[$1]*75):2:(sxI[$1]) axis x1y2 title "Xray vs T" with xerrorline lw 3
         pt 7 lt 8
485    pause plot_pause "FM2 ".CH
486   }
487
488   x1 = 24
489   x2 = 280
490
491   if (fit_all) {
492    set print resultfile append
493    do for [T in TEMPS] {
494     i = ix(T)
495     ax=axI[i];ex=exI[i];sx=sxI[i];ab=abI[i];ba=baI[i];bs=bsI[i];bca=bcaI[i];bcs=bcsI[i];
           ac=acI[i];ec=ecI[i];sc=scI[i];
496     fit [x1:x2] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ac, ab, ba,
           bca
497     fit [x1:x2] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ac, ab, ba,
           bca,                ex, ec
498     fit [x1:x2] f(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ac, ab, ba,
           bca, sx, sc, bs, bcs, ex, ec
499     axI[i]=ax;exI[i]=ex;sxI[i]=sx;abI[i]=ab;baI[i]=ba;bsI[i]=bs;bcaI[i]=bca;bcsI[i]=bcs;
           acI[i]=ac;ecI[i]=ec;scI[i]=sc;
500     print sprintf("FM2_%s_ax_%d  = %10.6g; FM2_%s_ax_err_%d  = %10.6g # %s °C", CH, i, ax
```

```
        , CH, i, ax_err , T)
501     print sprintf("FM2_%s_ex_%d  = %10.6g; FM2_%s_ex_err_%d  = %10.6g # %s °C", CH, i, ex
        , CH, i, ex_err , T)
502     print sprintf("FM2_%s_sx_%d  = %10.6g; FM2_%s_sx_err_%d  = %10.6g # %s °C", CH, i, sx
        , CH, i, sx_err , T)
503     print sprintf("FM2_%s_ab_%d  = %10.6g; FM2_%s_ab_err_%d  = %10.6g # %s °C", CH, i, ab
        , CH, i, ab_err , T)
504     print sprintf("FM2_%s_ba_%d  = %10.6g; FM2_%s_ba_err_%d  = %10.6g # %s °C", CH, i, ba
        , CH, i, ba_err , T)
505     print sprintf("FM2_%s_bs_%d  = %10.6g; FM2_%s_bs_err_%d  = %10.6g # %s °C", CH, i, bs
        , CH, i, bs_err , T)
506     print sprintf("FM2_%s_bca_%d = %10.6g; FM2_%s_bca_err_%d = %10.6g # %s °C", CH, i,
        bca, CH, i, bca_err , T)
507     print sprintf("FM2_%s_bcs_%d = %10.6g; FM2_%s_bcs_err_%d = %10.6g # %s °C", CH, i,
        bcs, CH, i, bcs_err , T)
508     print sprintf("FM2_%s_ac_%d  = %10.6g; FM2_%s_ac_err_%d  = %10.6g # %s °C", CH, i, ac
        , CH, i, ac_err , T)
509     print sprintf("FM2_%s_ec_%d  = %10.6g; FM2_%s_ec_err_%d  = %10.6g # %s °C", CH, i, ec
        , CH, i, ec_err , T)
510     print sprintf("FM2_%s_sc_%d  = %10.6g; FM2_%s_sc_err_%d  = %10.6g # %s °C", CH, i, sc
        , CH, i, sc_err , T)
511     set x2ra [0:300/exI[i]]
512     replot
513     pause plot_pause "FM2 ".CH." ".T."°C"
514    }
515    unset print
516   }
517
518  }
519
520  if (!exist("FM2_C1H_ee0")) { FM2_C1H_ee0 = 0.101327 }
521  if (!exist("FM2_C1H_ee1")) { FM2_C1H_ee1 = 2.15528e-05 }
522  if (!exist("FM2_C1H_ee2")) { FM2_C1H_ee2 = -2.15528e-05 }
523
524  if (plot_all) {
525    @DEFAULTS
526    set xra [*:*]
527    set yra [*:*]
528    set xlab "Temperature"
529    set format x "%.0f°C"
530    unset log
531    calstr(i) = sprintf('FM2 C1H (%.4f + %.1f ppm/°C × T − %g ppm/°C^2 × T^2) mV/keV',
       FM2_C1H_ee0, FM2_C1H_ee1*1e6, -FM2_C1H_ee2*1e6)
532    plot for [l in "x c"] "<awk '/_C.H_e".l."_/;/_ax_1/{print Nix}' ".resultfile u 8:3:6
       tit "e".l w errorline, \
533       FM2_C1H_ee0+FM2_C1H_ee1*x+FM2_C1H_ee2*x*x tit calstr(1) with l lw 3
534    pause plot_pause "FM2 HET C"
535  }
536
537  if (fit_all) {
538    fit FM2_C1H_ee0+FM2_C1H_ee1*x+FM2_C1H_ee2*x*x "<awk '/_C.H_e[xc]_/' ".resultfile u
       8:3:6 zerror via FM2_C1H_ee0,FM2_C1H_ee1,FM2_C1H_ee2
539    set print resultfile append
540    print sprintf("FM2_C1H_ee0  = %10.6g; FM2_C1H_ee0_err  = %10.6g", FM2_C1H_ee0,
       FM2_C1H_ee0_err)
541    print sprintf("FM2_C1H_ee1  = %10.6g; FM2_C1H_ee1_err  = %10.6g", FM2_C1H_ee1,
       FM2_C1H_ee1_err)
542    print sprintf("FM2_C1H_ee2  = %10.6g; FM2_C1H_ee2_err  = %10.6g", FM2_C1H_ee2,
       FM2_C1H_ee2_err)
543    unset print
544    replot
545    pause plot_pause "FM2 ".CH." TC"
546  }
547
548  print sprintf("FM2_C1H_SiH_calib = %.3f / (1+T_HET1*(%.4g %+.4g*T_HET1))", 1/mV/
       FM2_C1H_ee0, FM2_C1H_ee1/FM2_C1H_ee0, FM2_C1H_ee2/FM2_C1H_ee0)
549
550  # C BB muons  ############################################################
551
552  x1 = 500
553  x2 = 2000
554  a=10
555  e=1200
556  s=e/10
557
558  do for [i=1:N] { aI[i]=a; eI[i]=e; sI[i]=s; eI_err[i]=1 }
559  CH="BB_C"
560
561  do for [i=1:N] {
562   eval sprintf('if(exists("FM2_%s_e_%d")) { eI[%d]=FM2_%s_e_%d }',  CH, i, i, CH, i)
563   eval sprintf('if(exists("FM2_%s_a_%d")) { aI[%d]=FM2_%s_a_%d }',  CH, i, i, CH, i)
```

```
564   eval sprintf('if(exists("FM2_%s_s_%d")) { sI[%d]=FM2_%s_s_%d }', CH, i, i, CH, i)
565   eval sprintf('if(exists("FM2_%s_e_err_%d")) { eI_err[%d]=FM2_%s_e_err_%d }', CH, i, i,
          CH, i)
566 }
567
568 if (plot_all) {
569   @DEFAULTS
570   set key noenhanced
571   set xra [x1:x2]
572   set yra [0:*]
573   unset log y
574   calstr(i) = sprintf('FM2 %s %3s°C peak %5.0f width %.4f height %5.0f', CH, TEMP[i], eI
        [i], sI[i]/eI[i], aI[i]*sI[i])
575   plot for [TT in TEMPS] fn_bb_c(TT) tit calstr(ix(TT)) with histeps lt ix(TT) lw 2, \
576        for [i=1:N] mips(aI[i], eI[i], sI[i], x) notit with lines lt i, \
577        Temp u (eI[$1]):2 axis x1y2 title "peak vs T" with lp lw 3 pt 7 lt 7
578   pause plot_pause "FM2 BB muons in C"
579 }
580
581 if (fit_all) {
582   set print resultfile append
583   do for [T in TEMPS] {
584    i = ix(T)
585    e=eI[i]; a=aI[i]; s=sI[i];
586    fit [0.75*e:1.8*e] mips(a,e,s, x) fn_bb_c(T) using 1:2:(sqrt($2+10)) zerror via a,e,s
587    eI[i]=e; aI[i]=a; sI[i]=s; eI_err[i] = e_err
588    print sprintf("FM2_%s_e_%d  = %10.6g; FM2_%s_e_err_%d  = %10.6g # %s °C", CH, i, e,
        CH, i, e_err , T)
589    print sprintf("FM2_%s_a_%d  = %10.6g; FM2_%s_a_err_%d  = %10.6g # %s °C", CH, i, a,
        CH, i, a_err , T)
590    print sprintf("FM2_%s_s_%d  = %10.6g; FM2_%s_s_err_%d  = %10.6g # %s °C", CH, i, s,
        CH, i, s_err , T)
591    replot
592    pause plot_pause "FM2 BB muons in C ".T."°C"
593   }
594   unset print
595 }
596
597 FM2_BGO_cal(T) = FM2_BGO_BB0*(1-T*(FM2_BGO_BB1+T*(FM2_BGO_BB2/1e4)))
598 if (!exists("FM2_BGO_BB0")) { FM2_BGO_BB0 = 1000          }
599 if (!exists("FM2_BGO_BB1")) { FM2_BGO_BB1 = 7.3/FM2_BGO_BB0 }
600 if (!exists("FM2_BGO_BB2")) { FM2_BGO_BB2 = 0             }
601
602 s = sprintf("BB muons cal(T) = %.0f × (1 - %.3g%%/°C T + %.3g ppm/°C² T²)", FM2_BGO_BB0,
        100*FM2_BGO_BB1, -100*FM2_BGO_BB2)
603
604 if (plot_all) {
605   @DEFAULTS
606   set key enh
607   set xra [*:*]
608   unset log y
609   set yra [*:*]
610   set xlab "Temperature"
611   set format x "%.0f°C"
612   unset y2tics
613   unset x2tics
614   unset x2lab
615   plot Temp u 2:(eI[$1]):(eI_err[$1]) notit with errorlines, FM2_BGO_cal(x) tit s
616   pause plot_pause "FM2 BB muons in C temp model"
617 }
618
619 if (fit_all) {
620   FM2_BGO_BB2 = 0.001
621   FM2_BGO_BB3 = 0; FM2_BGO_BB3_err = 0
622   set print resultfile append
623   fit FM2_BGO_cal(x) Temp u 2:(eI[$1]):(eI_err[$1]) zerror via FM2_BGO_BB0, FM2_BGO_BB1,
        FM2_BGO_BB2
624   print 'GPFUN_FM2_BGO_cal="'.GPFUN_FM2_BGO_cal.'"'
625   print sprintf("FM2_BGO_BB0 = %10.6g ; FM2_BGO_BB0_err = %10.6g", FM2_BGO_BB0,
        FM2_BGO_BB0_err)
626   print sprintf("FM2_BGO_BB1 = %10.6g ; FM2_BGO_BB1_err = %10.6g", FM2_BGO_BB1,
        FM2_BGO_BB1_err)
627   print sprintf("FM2_BGO_BB2 = %10.6g ; FM2_BGO_BB2_err = %10.6g", FM2_BGO_BB2,
        FM2_BGO_BB2_err)
628   unset print
629   replot
630   pause plot_pause "FM2 BB muons in C temp model"
631 }
632
633 # C ABBA muons  ##########################################################
634
635 abba_cut = "1"
```

```
636 fn_abba(c, cut) = "<awk '".cut."' ".fn_base."-x.BGO_T | hist.py -k ".c." -s 1./30 "
637
638 f(x) = mips(FM2_ABBA_C_a,FM2_ABBA_C_e*keV_ABBA,FM2_ABBA_C_s, x)
639 if (!exist("FM2_ABBA_C_a")) { FM2_ABBA_C_a = 10          }
640 if (!exist("FM2_ABBA_C_e")) { FM2_ABBA_C_e = 1000/keV_ABBA }
641 if (!exist("FM2_ABBA_C_s")) { FM2_ABBA_C_s = 100         }
642
643 if (plot_all) {
644   @DEFAULTS
645   set key enh
646   set xra  [400:2000]
647   set x2ra [400/FM2_ABBA_C_e:2000/FM2_ABBA_C_e]
648   unset log y
649   set yra [*:*]
650   plot fn_abba(7, 1) tit "uncal" w histeps, fn_abba(8, 1) tit "uncut" w histeps, fn_abba
        (8, abba_cut) tit "cut" w histeps lw 2, f(x)
651   pause plot_pause "FM2 ABBA muons"
652 }
653
654 if (fit_all) {
655   set print resultfile append
656   fit f(x) fn_abba(8, abba_cut) u 1:2:(sqrt($2+3)) via FM2_ABBA_C_a, FM2_ABBA_C_e,
        FM2_ABBA_C_s
657   print sprintf("FM2_ABBA_C_a = %10.6g; FM2_ABBA_C_a_err = %10.6g", FM2_ABBA_C_a,
        FM2_ABBA_C_a_err)
658   print sprintf("FM2_ABBA_C_e = %10.6g; FM2_ABBA_C_e_err = %10.6g", FM2_ABBA_C_e,
        FM2_ABBA_C_e_err)
659   print sprintf("FM2_ABBA_C_s = %10.6g; FM2_ABBA_C_s_err = %10.6g", FM2_ABBA_C_s,
        FM2_ABBA_C_s_err)
660   unset print
661   set x2ra [400/mV/FM2_ABBA_C_e:2000/mV/FM2_ABBA_C_e]
662   replot
663   pause plot_pause "FM2 ABBA muons"
664 }
665
666 if (plot_all) {
667   @DEFAULTS
668   set key enh
669   set xra [*:*]
670   unset log y
671   set yra [*:*]
672   set xlab "Temperature"
673   set format x "%.0f°C"
674   unset y2tics
675   unset x2tics
676   unset x2lab
677   plot Temp u 2:(exI[$1]*mV/FM2_ABBA_C_e*FM2_BGO_BB0/FM2_BGO_cal($2)) tit "C1H Si/BGO
        ratio" with lp
678   pause plot_pause "Si/Light ratio"
679 }
680
681 #FM2_BGO_cal(T) = FM2_BGO_BB0*(1-T*(FM2_BGO_BB1+T*(FM2_BGO_BB2/1e4)))
682 print sprintf("FM2_BGO_calib = %.3f / (1 - T_HET1*(%.4g %+.4g*T_HET1))", 1/FM2_ABBA_C_e,
       FM2_BGO_BB1, FM2_BGO_BB2/1e4)
683
684 # C2H/C1H gain ratio  ############################################################
685
686 x1 = 1000
687 x2 = 5000
688 ratio = 1.0
689
690 CH="C2H_C1H"
691
692 do for [i=1:N] { eI[i]=ratio }
693 do for [i=1:N] { eval sprintf('if(exists("FM2_%s_ratio_%d")) { eI[%d]=FM2_%s_ratio_%d }'
      , CH, i, i, CH, i) }
694
695 fn(T) = "<./HETEPT.awk 'isBB()>1{print $C2H/$C1H}' SiH_ratio=1.1 ".fn_bb(T)." | hist.py
      -s 100"
696
697 if (plot_all) {
698   @DEFAULTS
699   set key noenhanced
700   set xra [500:5000]
701   set yra [0.8:1.2]
702   unset log y
703   set log x
704   set x2ra [*:*]
705   set format x2 "%.1f°C"
706   set y2lab "Temperature"
707   calstr(i) = sprintf('FM2 %s %3s°C ratio %.4g', CH, TEMP[i], eI[i])
708   plot for [TT in TEMPS] fn_bgo(TT) u 3:($4/$3) notit with p lt ix(TT) pt 2 ps 0.5, \
709        for [i=1:N] eI[i] tit calstr(i) with lines lt i lw 2, \
```

```
710         Temp u 2:(eI[$1]) axis x2y1 not with lp lt 8 pt 7
711     pause plot_pause "FM2 C2H/C1H"
712   }
713
714   if (fit_all) {
715     set print resultfile append
716     do for [T in TEMPS] {
717       i = ix(T)
718       e = eI[i]
719       fit [500:5000] [500:5000] e*x fn_bgo(T) u 3:4:(sqrt(1.0/$3/$4)) zerror via e
720       eI[i]=e
721       print sprintf("FM2_%s_ratio_%d  = %10.6g; FM2_%s_ratio_err_%d  = %10.6g # %s °C", CH,
          i, e, CH, i, e_err , T)
722       replot
723       pause plot_pause "FM2 C2H/C1H"
724     }
725     unset print
726   }
727
728   # C.L/C.H gain ratio  ##########################################################
729
730   ratio = 14
731
732   do for [CHi=1:2] {
733    CH = "C".CHi."L"
734
735    do for [i=1:N] { eval sprintf('if(exists("FM2_%s_ratio_%d")) { eI[%d]=FM2_%s_ratio_%d }
         ', CH, i, i, CH, i) }
736    do for [i=1:N] { eval sprintf('if(exists("FM2_%s_ratio_err_%d")) { eI_err[%d]=FM2_%
         s_ratio_err_%d }', CH, i, i, CH, i) }
737
738    if (plot_all) {
739     @DEFAULTS
740     set xra [500:30000]
741     set yra [0.065:0.08]
742     unset log y
743     set log x
744     set x2ra [*:*]
745     set format x2 "%.1f°C"
746     set y2lab "Temperature"
747     calstr(i) = sprintf('FM2 %s %3s°C ratio %.2f', CH, TEMP[i], eI[i])
748     plot for [TT in TEMPS] fn_bgo(TT) u 2+CHi:(column(4+CHi)/column(2+CHi)) notit with p
          lt ix(TT) pt 2 ps 0.5, \
749          for [i=1:N] 1.0/eI[i] tit calstr(i) with lines lt i lw 2, \
750          Temp u 2:(1.0/eI[$1]) axis x2y1 not with lp lt 8 pt 7
751     pause plot_pause "FM2 ".CH
752    }
753
754    if (fit_all) {
755     set print resultfile append
756     do for [T in TEMPS] {
757       i = ix(T)
758       e = eI[i]
759       fit [2000:30000] [*:*]  x/e fn_bgo(T) u 2+CHi:4+CHi:(1.0/column(2+CHi)) zerror via e
760       eI[i]=e; eI_err[i]=e_err
761       print sprintf("FM2_%s_ratio_%d  = %10.6g; FM2_%s_ratio_err_%d  = %10.6g # %s °C", CH,
          i, e, CH, i, e_err , T)
762       replot
763     }
764     unset print
765    }
766   }
767
768   FM2_BGO_HL_cal(T) = FM2_BGO_HL0*(1 + T*(FM2_BGO_HL1 + T*(FM2_BGO_HL2)))
769   if (!exists("FM2_BGO_HL0")) { FM2_BGO_HL0 = 14     }
770   if (!exists("FM2_BGO_HL1")) { FM2_BGO_HL1 = 0.01   }
771   if (!exists("FM2_BGO_HL2")) { FM2_BGO_HL2 = 0.001  }
772
773   s = sprintf("BGO High/Low gain = %.0f × (1 %+.3g ppm/°C×T %+.3g ppm/°C²×T²)",
       FM2_BGO_HL0, 1e6*FM2_BGO_HL1, 1e6*FM2_BGO_HL2)
774
775   fn(CH) = "<awk '/_ratio_1/{print Nix};/FM2_".CH."_ratio/' ".resultfile
776
777   if (plot_all) {
778     @DEFAULTS
779     set key enh
780     set xra [*:*]
781     unset log y
782     set yra [*:*]
783     set xlab "Temperature"
784     set format x "%.0f°C"
785     unset y2tics
```

```
786     unset x2tics
787     unset x2lab
788     plot  for [c in "C1L C2L"] fn(c) u 8:3:6 tit c w errorline pt 7, \
789           FM2_BGO_HL_cal(x) tit s w l lw 2
790     pause plot_pause "FM2 BB high/low"
791   }
792
793   if (fit_all) {
794     FM2_BGO_HL2 = 0.001
795     set print resultfile append
796     fit FM2_BGO_HL_cal(x) fn("C[12]L") u 8:3:6 zerror via FM2_BGO_HL0, FM2_BGO_HL1,
          FM2_BGO_HL2
797     print 'GPFUN_FM2_BGO_HL_cal="'.GPFUN_FM2_BGO_HL_cal.'"'
798     print sprintf("FM2_BGO_HL0 = %10.6g ; FM2_BGO_HL0_err = %10.6g", FM2_BGO_HL0,
          FM2_BGO_HL0_err)
799     print sprintf("FM2_BGO_HL1 = %10.6g ; FM2_BGO_HL1_err = %10.6g", FM2_BGO_HL1,
          FM2_BGO_HL1_err)
800     print sprintf("FM2_BGO_HL2 = %10.6g ; FM2_BGO_HL2_err = %10.6g", FM2_BGO_HL2,
          FM2_BGO_HL2_err)
801     unset print
802     replot
803     pause plot_pause "FM2 BB high/low"
804   }
805
806   # FM2_BGO_HL_cal(T) = FM2_BGO_HL0*(1 + T*(FM2_BGO_HL1 + T*(FM2_BGO_HL2)))
807   print sprintf("FM2_BGO_L_calib = FM2_BGO_calib * %.3f * (1 + T_HET1*(%.4g %+.4g*T_HET1))
        ", FM2_BGO_HL0, FM2_BGO_HL1, FM2_BGO_HL2)
808
809   # HET AB X-rays  edge ##############################################################
810
811   ax  =    17.0809
812   ex  =  0.0738822
813   sx  =   0.336593
814   ba  =    685.626
815   bs  =      10.45
816   ec  =  ex
817
818   do for [i=1:N] {
819   axI[i]  = ax
820   exI[i]  = ex
821   sxI[i]  = sx
822   abI[i]  = ab
823   baI[i]  = ba
824   bsI[i]  = bs
825   bcaI[i] = bca
826   bcsI[i] = bcs
827   acI[i]  = ac
828   ecI[i]  = ec
829   scI[i]  = sc
830   }
831
832   HET_chs = "A11H A12H A21H A22H B11H B12H"
833   HET_chN = words(HET_chs)
834   HET_ch(ci) = word(HET_chs, ci)
835
836   fxI(I, x) = biXB(axI[I], exI[I], sxI[I], axI[i]/5, exI[I]*1.05, exI[I]*6, baI[I], bsI[I
        ], x) + 0.5
837   fx(x)     = biXB(ax,     ex,     sx,     ax/5,     ex*1.05,     ex*6,     ba,     bs,
          x) + 0.5
838
839   do for [ci=1:HET_chN] {
840    CH= HET_ch(ci)
841    eval "CHI = ".CH
842
843    do for [i=1:N] {
844     eval sprintf('if(exists("FM2_%s_ax_%d")) { axI[%d] =FM2_%s_ax_%d }', CH, i, i, CH, i
          )
845     eval sprintf('if(exists("FM2_%s_ex_%d")) { exI[%d] =FM2_%s_ex_%d }', CH, i, i, CH, i
          )
846     eval sprintf('if(exists("FM2_%s_sx_%d")) { sxI[%d] =FM2_%s_sx_%d }', CH, i, i, CH, i
          )
847     eval sprintf('if(exists("FM2_%s_ba_%d")) { baI[%d] =FM2_%s_ba_%d }', CH, i, i, CH, i
          )
848     eval sprintf('if(exists("FM2_%s_bs_%d")) { bsI[%d] =FM2_%s_bs_%d }', CH, i, i, CH, i
          )
849   }
850
851    if (plot_all) {
852     @DEFAULTS
853     set yra [10:*]
854     set xra [0:15]
855     set x2ra [0:15/exI[1]]
856     calstr(i) = sprintf('FM2 %-4s %3s°C X-ray: %6.4f mV/keV, σ %5.2f keV', \
```

```
857       CH, TEMP[i], exI[i]*mV, sxI[i]/exI[i])
858     plot for [TT in TEMPS] fn_xrays(TT) u 1:CHI tit calstr(ix(TT)) with histeps lt ix(TT)
          lw 2, \
859          for [i=1:N] fxI(i,x) notit with lines lt i, \
860          Temp u (exI[$1]*75):2:(sxI[$1]) axis x1y2 title "Xray vs T" with xerrorline lw 3
          pt 7 lt 8
861     pause plot_pause "FM2 X-ray ".CH
862     }
863
864    x1 = 3
865    x2 = 8
866
867    if (fit_all) {
868     set print resultfile append
869     do for [T in TEMPS] {
870      i = ix(T)
871      ax=axI[i];ex=exI[i];sx=sxI[i];ab=abI[i];ba=baI[i];bs=bsI[i]
872      fit [x1:x2] fx(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba
873      fit [x1:x2] fx(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba, sx, bs
           , ex
874      axI[i]=ax;exI[i]=ex;sxI[i]=sx;abI[i]=ab;baI[i]=ba;bsI[i]=bs
875      print sprintf("FM2_%s_ax_%d  = %10.6g; FM2_%s_ax_err_%d  = %10.6g # %s °C %d", CH, i,
           ax, CH, i, ax_err, T, ci)
876      print sprintf("FM2_%s_ex_%d  = %10.6g; FM2_%s_ex_err_%d  = %10.6g # %s °C %d", CH, i,
           ex, CH, i, ex_err, T, ci)
877      print sprintf("FM2_%s_sx_%d  = %10.6g; FM2_%s_sx_err_%d  = %10.6g # %s °C %d", CH, i,
           sx, CH, i, sx_err, T, ci)
878      print sprintf("FM2_%s_ba_%d  = %10.6g; FM2_%s_ba_err_%d  = %10.6g # %s °C %d", CH, i,
           ba, CH, i, ba_err, T, ci)
879      print sprintf("FM2_%s_bs_%d  = %10.6g; FM2_%s_bs_err_%d  = %10.6g # %s °C %d", CH, i,
           bs, CH, i, bs_err, T, ci)
880      set x2ra [0:15/exI[i]]
881      replot
882      pause plot_pause "FM2 X-ray ".CH." ".T
883      }
884     unset print
885     }
886
887   }
888
889   # HET AB Compton edge ##########################################################
890
891   fcI(I, x) = biC(acI[I], ecI[I], scI[I], bcaI[I], bcsI[I],  x) + 0.5
892   fc(x)     = biC(ac,     ec,     sc,     bca,     bcs,      x) + 0.5
893
894   do for [ci=1:HET_chN] {
895    CH= HET_ch(ci)
896    eval "CHI = ".CH
897
898    do for [i=1:N] {
899     eval sprintf('if(exists("FM2_%s_ex_%d"))   { ecI[%d] =FM2_%s_ex_%d }',   CH, i, i, CH,
          i)
900     eval sprintf('if(exists("FM2_%s_ac_%d"))   { acI[%d] =FM2_%s_ac_%d }',   CH, i, i, CH,
          i)
901     eval sprintf('if(exists("FM2_%s_ec_%d"))   { ecI[%d] =FM2_%s_ec_%d }',   CH, i, i, CH,
          i)
902     eval sprintf('if(exists("FM2_%s_sc_%d"))   { scI[%d] =FM2_%s_sc_%d }',   CH, i, i, CH,
          i)
903     eval sprintf('if(exists("FM2_%s_bca_%d"))  { bcaI[%d] =FM2_%s_bca_%d }',  CH, i, i, CH
          , i)
904     eval sprintf('if(exists("FM2_%s_bcs_%d"))  { bcsI[%d] =FM2_%s_bcs_%d }',  CH, i, i, CH
          , i)
905     }
906
907    if (plot_all) {
908     @DEFAULTS
909     set yra [1:*]
910     set xra [0:60]
911     set x2ra [0:60/ecI[1]]
912     calstr(i) = sprintf('FM2 %-4s %3s°C Compton: %6.4f mV/keV, σ %5.2f keV', CH, TEMP[i],
          ecI[i]*mV, scI[i]/ecI[i])
913     plot for [TT in TEMPS] fn_xrays(TT) u 1:CHI tit calstr(ix(TT)) with histeps lt ix(TT)
          lw 2, \
914          for [i=1:N] fcI(i,x) notit with lines lt i, \
915          Temp u (ecI[$1]*393):2:(scI[$1]) axis x1y2 title "Compton Edge vs T" with
          xerrorline lw 3 pt 7 lt 8
916     pause plot_pause "FM2 Compton ".CH
917     }
918
919    x1 = 20
920    x2 = 35
921
```

```
 if (fit_all) {

  set print resultfile append
  do for [T in TEMPS] {
   i = ix(T)
   ac=acI[i];ec=ecI[i];sc=scI[i];bca=bcaI[i];bcs=bcsI[i]
   fit [x1:x2] fc(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca, bcs
   fit [x1:x2] fc(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca, bcs,
     ec
   fit [x1:x2] fc(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca, bcs,
     ec, sc
   acI[i]=ac;ecI[i]=ec;scI[i]=sc;bcaI[i]=bca;bcsI[i]=bcs
   print sprintf("FM2_%s_ac_%d  = %10.6g; FM2_%s_ac_err_%d  = %10.6g # %s °C %d", CH, i,
     ac,  CH, i, ac_err,  T, ci)
   print sprintf("FM2_%s_ec_%d  = %10.6g; FM2_%s_ec_err_%d  = %10.6g # %s °C %d", CH, i,
     ec,  CH, i, ec_err,  T, ci)
   print sprintf("FM2_%s_sc_%d  = %10.6g; FM2_%s_sc_err_%d  = %10.6g # %s °C %d", CH, i,
     sc,  CH, i, sc_err,  T, ci)
   print sprintf("FM2_%s_bca_%d = %10.6g; FM2_%s_bca_err_%d = %10.6g # %s °C %d", CH, i,
     bca, CH, i, bca_err, T, ci)
   print sprintf("FM2_%s_bcs_%d = %10.6g; FM2_%s_bcs_err_%d = %10.6g # %s °C %d", CH, i,
     bcs, CH, i, bcs_err, T, ci)
   set x2ra [0:60/ecI[i]]
   replot
   pause plot_pause "FM2 Compton ".CH." ".T
   }
  unset print
  }

}

# HET AB TC ##############################################################

do for [i=1:30] { ee0[i]=0.075;  ee1[i]=1.0;  ee2[i]=1.0; }

v(ci, v) = "FM2_".HET_ch(ci)."_".v

do for [ci=1:HET_chN] {
 if (exist(v(ci,'ee0'))) { eval "ee0[".ci."] = ".v(ci,'ee0') }
 if (exist(v(ci,'ee1'))) { eval "ee1[".ci."] = ".v(ci,'ee1') }
 if (exist(v(ci,'ee2'))) { eval "ee2[".ci."] = ".v(ci,'ee2') }
}

fn_het_cal(c, l) = "<awk '/_".c."_e".l."_/;/_a[cx]_1/{print Nix}' ".resultfile
f_het_cal(ci, t) =  ee0[ci]*(1 + t*(ee1[ci]/100 + ee2[ci]/1e6*t))

if (plot_all) {
  @DEFAULTS
  set xra [*:*]
  set yra [0.06:0.083]
  set xlab "Temperature"
  set format x "%.0f°C"
  unset log
  calstr(i) = sprintf('FM2 %s %.4f×(1 %+.3g %%/°C T %+.3g pp/°C² T²) mV/keV', HET_ch(i),
    ee0[i], ee1[i], ee2[i])
  plot for [cii=1:HET_chN] fn_het_cal(HET_ch(cii), 'x') u 8:3:6 notit w errorline lt cii
    pt 2, \
      for [cii=1:HET_chN] fn_het_cal(HET_ch(cii), 'c') u 8:3:6 notit w errorline lt cii
    pt 6, \
      for [cii=1:HET_chN] f_het_cal(cii, x) tit calstr(cii) with l lt cii lw 3
  pause plot_pause "FM2 HET TC"
}

if (fit_all) {
 do for [ci=1:HET_chN] {
  CH=HET_ch(ci)
  e0=ee0[ci]; e1=ee1[ci]; e2=ee2[ci]
  fit [] [0.05:0.09] e0*(1 + x*(e1/100 + e2/1e6*x)) fn_het_cal(CH, '[cx]') u 8:3:6
    zerror via e0,e1,e2
  ee0[ci]=e0; ee1[ci]=e1; ee2[ci]=e2
  set print resultfile append
  print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee0'), e0, v(ci,'ee0'), e0_err)
  print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee1'), e1, v(ci,'ee1'), e1_err)
  print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee2'), e2, v(ci,'ee2'), e2_err)
  unset print
  replot
  pause plot_pause "FM2 HET TC ".CH
 }
}

if (!exist("FM2_HET_e0")) { FM2_HET_e0=1;  FM2_HET_e1=1; FM2_HET_e2=1 }
f(t) = FM2_HET_e0*(1 + t*(FM2_HET_e1/100 + FM2_HET_e2/1e6*t))
```

```
993
994   if (plot_all) {
995     @DEFAULTS
996     set xra [*:*]
997     set yra [0.95:1.1]
998     set xlab "Temperature"
999     set format x "%.0f°C"
1000    unset log
1001    calstr(i) = sprintf('FM2 HET %.4f×(1 %+.2g %%/°C T %+.2g ppm/°C² T²) mV/keV',
          FM2_HET_e0, FM2_HET_e1, FM2_HET_e2)
1002    plot for [cii=1:HET_chN] fn_het_cal(HET_ch(cii), 'x') u 8:($3/ee0[$10]):6 tit HET_ch(
          cii) w errorline lt cii pt 2, \
1003       for [cii=1:HET_chN] fn_het_cal(HET_ch(cii), 'c') u 8:($3/ee0[$10]):6 notit
             w errorline lt cii pt 6, \
1004       f(x) tit calstr(1) with l lt 8 lw 3
1005    pause plot_pause "FM2 HET TC"
1006  }
1007
1008  if (fit_all) {
1009    fit f(x) fn_het_cal('[AB][12][12]H', '[cx]') u 8:($3/ee0[$10]):6 zerror via FM2_HET_e0
         , FM2_HET_e1, FM2_HET_e2
1010    set print resultfile append
1011    print sprintf("FM2_HET_e0 = %10.6g; FM2_HET_e0_err = %10.6g", FM2_HET_e0,
          FM2_HET_e0_err)
1012    print sprintf("FM2_HET_e1 = %10.6g; FM2_HET_e1_err = %10.6g", FM2_HET_e1,
          FM2_HET_e1_err)
1013    print sprintf("FM2_HET_e2 = %10.6g; FM2_HET_e2_err = %10.6g", FM2_HET_e2,
          FM2_HET_e2_err)
1014    unset print
1015    replot
1016    pause plot_pause "FM2 HET TC"
1017  }
1018
1019  print sprintf("FM2_HET_HG_TC = 1.0 / (1 + T_HET1*(%.4g %+.4g*T_HET1))", FM2_HET_e1/100,
        FM2_HET_e2/1e6)
1020  do for [ci=1:HET_chN] {
1021      CH=HET_ch(ci)
1022      print sprintf("FM2_%s_calib = %.3f * FM2_HET_HG_TC", CH, 1/mV/ee0[ci])
1023  }
1024
1025  # HET B.3 X-rays and Compton edge
       ###############################################################
1026
1027  ax  = 444.684
1028  ex  = 0.100482    *5.5/7.4
1029  sx  = 0.280512
1030  ab  = 52.2564
1031  ba  = 1586.18
1032  bs  = 3.25276
1033  bca = 242.717
1034  bcs = 15.7392
1035  ac  = 282.445
1036  ec  = ex
1037  sc  = 0.825364   *2
1038
1039  do for [i=1:N] {
1040  axI[i]  = ax
1041  exI[i]  = ex   *6.5/5.5
1042  sxI[i]  = sx
1043  abI[i]  = ab
1044  baI[i]  = ba
1045  bsI[i]  = bs
1046  bcaI[i] = bca
1047  bcsI[i] = bcs
1048  acI[i]  = ac
1049  ecI[i]  = ex
1050  scI[i]  = sc
1051  }
1052
1053
1054  fxI(I, x) = biXB(axI[I], exI[I], sxI[I], axI[i]/5, exI[I]*1.05, exI[I]*6, baI[I], bsI[I
       ], x) + 0.5
1055  fx(x)     = biXB(ax,     ex,     sx,     ax/5,     ex*1.05,     ex*6,     ba,     bs,
          x) + 0.5
1056
1057  do for [CH in "B13G B23G"] {
1058
1059   eval "CHI = ".CH
1060
1061   do for [i=1:N] {
1062    eval sprintf('if(exists("FM2_%s_ax_%d")) { axI[%d] =FM2_%s_ax_%d }', CH, i, i, CH, i
         )
1063    eval sprintf('if(exists("FM2_%s_ex_%d")) { exI[%d] =FM2_%s_ex_%d }', CH, i, i, CH, i
```

```
        )
1064    eval sprintf('if(exists("FM2_%s_sx_%d")) { sxI[%d] =FM2_%s_sx_%d }', CH, i, i, CH, i
        )
1065    eval sprintf('if(exists("FM2_%s_ba_%d")) { baI[%d] =FM2_%s_ba_%d }', CH, i, i, CH, i
        )
1066    eval sprintf('if(exists("FM2_%s_bs_%d")) { bsI[%d] =FM2_%s_bs_%d }', CH, i, i, CH, i
        )
1067  }
1068
1069   if (plot_all) {
1070    @DEFAULTS
1071    set yra [1000:*]
1072    set xra [0:20]
1073    set x2ra [0:20/exI[1]]
1074    calstr(i) = sprintf('FM2 %-4s %3s°C X-ray: %6.4f mV/keV, σ %5.2f keV', CH, TEMP[i],
          exI[i]*mV, sxI[i]/exI[i])
1075    plot for [TT in TEMPS] fn_xrays(TT) u 1:CHI tit calstr(ix(TT)) with histeps lt ix(TT)
          lw 2, \
1076       for [i=1:N] fxI(i,x) notit with lines lt i, \
1077       Temp u (exI[$1]*75):2:(sxI[$1]) axis x1y2 title "Xray vs T" with xerrorline lw 3
          pt 7 lt 8
1078    pause plot_pause "FM2 X-ray ".CH
1079    }
1080
1081   x1 = 5
1082   x2 = 12
1083
1084   if (fit_all) {
1085
1086    set print resultfile append
1087    do for [T in TEMPS] {
1088     i = ix(T)
1089     ax=axI[i];ex=exI[i];sx=sxI[i];ba=baI[i];bs=bsI[i]
1090     fit [x1:x2] fx(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba
1091     fit [x1:x2] fx(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba, sx, bs
          , ex
1092     axI[i]=ax;exI[i]=ex;sxI[i]=sx;baI[i]=ba;bsI[i]=bs
1093     print sprintf("FM2_%s_ax_%d  = %10.6g; FM2_%s_ax_err_%d  = %10.6g # %s °C", CH, i, ax
          , CH, i, ax_err , T)
1094     print sprintf("FM2_%s_ex_%d  = %10.6g; FM2_%s_ex_err_%d  = %10.6g # %s °C", CH, i, ex
          , CH, i, ex_err , T)
1095     print sprintf("FM2_%s_sx_%d  = %10.6g; FM2_%s_sx_err_%d  = %10.6g # %s °C", CH, i, sx
          , CH, i, sx_err , T)
1096     print sprintf("FM2_%s_ba_%d  = %10.6g; FM2_%s_ba_err_%d  = %10.6g # %s °C", CH, i, ba
          , CH, i, ba_err , T)
1097     print sprintf("FM2_%s_bs_%d  = %10.6g; FM2_%s_bs_err_%d  = %10.6g # %s °C", CH, i, bs
          , CH, i, bs_err , T)
1098     set x2ra [0:20/exI[i]]
1099     replot
1100     pause plot_pause "FM2 X-ray ".CH." ".T
1101     }
1102    unset print
1103   }
1104
1105  }
1106
1107  fcI(I, x) = biC(acI[I], ecI[I], scI[I], bcaI[I], bcsI[I],  x) + 0.5
1108  fc(x)     = biC(ac,     ec,     sc,     bca,     bcs,      x) + 0.5
1109
1110  do for [CH in "B13G B23G"] {
1111
1112   eval "CHI = ".CH
1113
1114   do for [i=1:N] {
1115    eval sprintf('if(exists("FM2_%s_ex_%d")) { ecI[%d] =FM2_%s_ex_%d }',   CH, i, i, CH,
          i)
1116    eval sprintf('if(exists("FM2_%s_ac_%d")) { acI[%d] =FM2_%s_ac_%d }',   CH, i, i, CH,
          i)
1117    eval sprintf('if(exists("FM2_%s_ec_%d")) { ecI[%d] =FM2_%s_ec_%d }',   CH, i, i, CH,
          i)
1118    eval sprintf('if(exists("FM2_%s_sc_%d")) { scI[%d] =FM2_%s_sc_%d }',   CH, i, i, CH,
          i)
1119    eval sprintf('if(exists("FM2_%s_bca_%d")) { bcaI[%d] =FM2_%s_bca_%d }', CH, i, i, CH
          , i)
1120    eval sprintf('if(exists("FM2_%s_bcs_%d")) { bcsI[%d] =FM2_%s_bcs_%d }', CH, i, i, CH
          , i)
1121    }
1122
1123   if (plot_all) {
1124    @DEFAULTS
1125    set yra [10:*]
1126    set xra [0:60]
```

```
1127    set x2ra [0:60/ecI[1]]
1128    calstr(i) = sprintf('FM2 %-4s %3s°C Compton: %6.4f mV/keV, σ %5.2f keV', CH, TEMP[i],
          ecI[i]*mV, scI[i]/ecI[i])
1129    plot for [TT in TEMPS] fn_xrays(TT) u 1:CHI tit calstr(ix(TT)) with histeps lt ix(TT)
          lw 2, \
1130         for [i=1:N] fcI(i,x) notit with lines lt i, \
1131         Temp u (ecI[$1]*393):2:(scI[$1]) axis x1y2 title "Compton Edge vs T" with
          xerrorline lw 3 pt 7 lt 8
1132    pause plot_pause "FM2 Compton ".CH
1133    }
1134
1135   x1 = 25
1136   x2 = 40
1137
1138   if (fit_all) {
1139
1140    set print resultfile append
1141    do for [T in TEMPS] {
1142     i = ix(T)
1143     ac=acI[i];ec=ecI[i];sc=scI[i];bca=bcaI[i];bcs=bcsI[i]
1144     fit [x1:x2] fc(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca, bcs
1145     fit [x1:x2] fc(x) fn_xrays(T) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca, bcs,
          ec, sc
1146     acI[i]=ac;ecI[i]=ec;scI[i]=sc;bcaI[i]=bca;bcsI[i]=bcs
1147     print sprintf("FM2_%s_ac_%d  = %10.6g; FM2_%s_ac_err_%d  = %10.6g # %s °C", CH, i, ac
          , CH, i, ac_err,  T)
1148     print sprintf("FM2_%s_ec_%d  = %10.6g; FM2_%s_ec_err_%d  = %10.6g # %s °C", CH, i, ec
          , CH, i, ec_err,  T)
1149     print sprintf("FM2_%s_sc_%d  = %10.6g; FM2_%s_sc_err_%d  = %10.6g # %s °C", CH, i, sc
          , CH, i, sc_err,  T)
1150     print sprintf("FM2_%s_bca_%d = %10.6g; FM2_%s_bca_err_%d = %10.6g # %s °C", CH, i,
          bca, CH, i, bca_err, T)
1151     print sprintf("FM2_%s_bcs_%d = %10.6g; FM2_%s_bcs_err_%d = %10.6g # %s °C", CH, i,
          bcs, CH, i, bcs_err, T)
1152     set x2ra [0:60/ecI[i]]
1153     replot
1154     pause plot_pause "FM2 Compton ".CH." ".T
1155     }
1156    unset print
1157   }
1158
1159  }
1160
1161  if (!exist("FM2_Bx3G_ee0")) { FM2_Bx3G_ee0 = 0.101327 }
1162  if (!exist("FM2_Bx3G_ee1")) { FM2_Bx3G_ee1 = 2.15528e-05 }
1163
1164  if (plot_all) {
1165    @DEFAULTS
1166    set xra [*:*]
1167    set yra [0.084:0.094]
1168    set xlab "Temperature"
1169    set format x "%.0f°C"
1170    unset log
1171    calstr(i) = sprintf('FM2 Bx3G (%.4f + %.1f ppm/°C × T) mV/keV', FM2_Bx3G_ee0,
          FM2_Bx3G_ee1*1e6)
1172    plot for [l in "x c"] "<awk '/_B.3G_e".l."_/;/_a[cx]_1/{print Nix}' ".resultfile u
          8:3:6 tit "e".l w errorline, \
1173         FM2_Bx3G_ee0+FM2_Bx3G_ee1*x tit calstr(1) with l lw 3
1174    pause plot_pause "FM2 Bx3G"
1175  }
1176
1177  if (fit_all) {
1178    fit [] [0.084:0.094] FM2_Bx3G_ee0+FM2_Bx3G_ee1*x "<awk '/_B.3G_e[xc]_/' ".resultfile u
          8:3:6 zerror via FM2_Bx3G_ee0,FM2_Bx3G_ee1
1179    set print resultfile append
1180    print sprintf("FM2_Bx3G_ee0  = %10.6g; FM2_Bx3G_ee0_err  = %10.6g", FM2_Bx3G_ee0,
          FM2_Bx3G_ee0_err)
1181    print sprintf("FM2_Bx3G_ee1  = %10.6g; FM2_Bx3G_ee1_err  = %10.6g", FM2_Bx3G_ee1,
          FM2_Bx3G_ee1_err)
1182    unset print
1183    replot
1184    pause plot_pause "FM2 Bx3G"
1185  }
1186
1187  e_avg(CH) = 0+system('./HETEPT.awk 2>/dev/null "/FM2_'.CH.'_e[x]_/{do_AVG(\$3, 1/(\$6/\
        $8)**2, \"'.CH.'\")};END{AVG(\"'.CH.'\");print AVG_m}" '.resultfile)
1188
1189  print sprintf("FM2_B3_TC = 1.0 / (1%+.4g*T_HET1)", FM2_Bx3G_ee1/FM2_Bx3G_ee0)
1190  do for [CH in "B13G B23G"] {
1191      e_b3 = e_avg(CH)
1192      print sprintf("FM2_%s_calib = %.3f * FM2_B3_TC", CH, 1/mV/e_b3)
1193  }
```

```
1194
1195  # HET gain ratio  ############################################################
1196
1197  ratio = 14
1198
1199  HL_chs = "A11L A12L A21L A22L B11L B12L B21L B22L"
1200  HL_chN = words(HL_chs)
1201  HL_ch(ci) = word(HL_chs, ci)
1202
1203  do for [ci=1:HL_chN] {
1204   CH= HL_ch(ci)
1205   eval "CHI = ".CH
1206
1207   do for [i=1:N] { eI[i]=ratio }
1208   do for [i=1:N] { eval sprintf('if(exists("FM2_%s_ratio_%d")) { eI[%d]=FM2_%s_ratio_%d }
         ', CH, i, i, CH, i) }
1209   do for [i=1:N] { eval sprintf('if(exists("FM2_%s_ratio_err_%d")) { eI_err[%d]=FM2_%
         s_ratio_err_%d }', CH, i, i, CH, i) }
1210
1211   if (plot_all) {
1212    @DEFAULTS
1213    set xra [500:10000]
1214    set yra [*:*]
1215    unset log y
1216    set log x
1217    set x2ra [*:*]
1218    set format x2 "%.1f°C"
1219    set y2lab "Temperature"
1220    calstr(i) = sprintf('FM2 %s %3s°C ratio %.2f', CH, TEMP[i], eI[i])
1221    plot for [TT in TEMPS] "<grep ".CH." ".fn_abhl(TT) u 4:($5/$4) notit with p lt ix(TT)
         pt 2 ps 0.9, \
1222        for [i=1:N] 1.0/eI[i] tit calstr(i) with lines lt i lw 2, \
1223        Temp u 2:(1.0/eI[$1]) axis x2y1 not with lp lt 8 pt 7
1224    pause plot_pause "FM2 ".CH
1225   }
1226
1227   if (fit_all) {
1228    set print resultfile append
1229    do for [T in TEMPS] {
1230     i = ix(T)
1231     e = eI[i]
1232     fit [500:10000] [*:*]  x/e "<grep ".CH." ".fn_abhl(T) u 4:5:(1.0/$4) zerror via e
1233     eI[i]=e; eI_err[i]=e_err
1234     print sprintf("FM2_%s_ratio_%d  = %10.6g; FM2_%s_ratio_err_%d  = %10.6g # %s °C %d",
           CH, i, e, CH, i, e_err, T, ci)
1235     replot
1236     pause plot_pause "FM2 ".CH." ".T
1237    }
1238    unset print
1239   }
1240  }
1241
1242  # HET High/Low TC ############################################################
1243
1244  do for [i=1:30] { ee0[i]=14;  ee1[i]=1.0;  ee2[i]=1.0; }
1245
1246  v(ci, v) = "FM2_".HL_ch(ci)."_".v
1247
1248  do for [ci=1:HL_chN] {
1249   if (exist(v(ci,'ee0'))) { eval "ee0[".ci."] = ".v(ci,'ee0') }
1250   if (exist(v(ci,'ee1'))) { eval "ee1[".ci."] = ".v(ci,'ee1') }
1251   if (exist(v(ci,'ee2'))) { eval "ee2[".ci."] = ".v(ci,'ee2') }
1252  }
1253
1254  fn_hl_cal(c) = "<awk '/_ratio_1/{print Nix};/FM2_".c."_ratio/' ".resultfile
1255  f_hl_cal(ci, t) =  ee0[ci]*(1 + t*(ee1[ci]/100 + ee2[ci]/1e6*t))
1256
1257  if (plot_all) {
1258    @DEFAULTS
1259    set xra [*:*]
1260    set yra [*:*]
1261    set xlab "Temperature"
1262    set format x "%.0f°C"
1263    unset log
1264    calstr(i) = sprintf('FM2 %s %.4f×(1 %+.3g %%/°C T %+.3g pp/°C² T²) mV/keV', HL_ch(i),
         ee0[i], ee1[i], ee2[i])
1265    plot for [cii=1:HL_chN] fn_hl_cal(HL_ch(cii)) u 8:3:6 notit w errorline lt cii pt 7, \
1266         for [cii=1:HL_chN] f_hl_cal(cii, x) tit calstr(cii) with l lt cii lw 3
1267    pause plot_pause "FM2 HL TC"
1268  }
1269
1270  if (fit_all) {
```

```
1271    do for [ci=1:HL_chN] {
1272     CH=HL_ch(ci)
1273     e0=ee0[ci]; e1=ee1[ci]; e2=ee2[ci]
1274     fit e0*(1 + x*(e1/100 + e2/1e6*x)) fn_hl_cal(CH) u 8:3:6 zerror via e0,e1,e2
1275     ee0[ci]=e0; ee1[ci]=e1; ee2[ci]=e2
1276     set print resultfile append
1277     print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee0'), e0, v(ci,'ee0'), e0_err)
1278     print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee1'), e1, v(ci,'ee1'), e1_err)
1279     print sprintf("%s = %10.6g; %s_err = %10.6g", v(ci,'ee2'), e2, v(ci,'ee2'), e2_err)
1280     unset print
1281     replot
1282     pause plot_pause "FM2 HL TC ".CH
1283    }
1284   }
1285
1286   if (!exist("FM2_HL_e0")) { FM2_HL_e0=1;  FM2_HL_e1=1; FM2_HL_e2=1 }
1287   f(t) = FM2_HL_e0*(1 + t*(FM2_HL_e1/100 + FM2_HL_e2/1e6*t))
1288
1289   if (plot_all) {
1290     @DEFAULTS
1291     set xra [*:*]
1292     set yra [*:*]
1293     set xlab "Temperature"
1294     set format x "%.0f°C"
1295     unset log
1296     calstr(i) = sprintf('FM2 HL %.4f×(1 %+.2g %%/°C T %+.2g ppm/°C² T²) mV/keV', FM2_HL_e0
          , FM2_HL_e1, FM2_HL_e2)
1297     plot for [cii=1:HL_chN] fn_hl_cal(HL_ch(cii)) u 8:($3/ee0[$10]):($6*1e2) tit HL_ch(cii
          ) w errorline lt cii pt 2, \
1298        f(x) tit calstr(1) with l lt 9 lw 3
1299     pause plot_pause "FM2 HL TC"
1300   }
1301
1302   if (fit_all) {
1303     fit f(x) fn_hl_cal('[AB][12][12]L') u 8:($3/ee0[$10]):6 zerror via FM2_HL_e0,
          FM2_HL_e1, FM2_HL_e2
1304     set print resultfile append
1305     print sprintf("FM2_HL_e0 = %10.6g; FM2_HL_e0_err = %10.6g", FM2_HL_e0, FM2_HL_e0_err)
1306     print sprintf("FM2_HL_e1 = %10.6g; FM2_HL_e1_err = %10.6g", FM2_HL_e1, FM2_HL_e1_err)
1307     print sprintf("FM2_HL_e2 = %10.6g; FM2_HL_e2_err = %10.6g", FM2_HL_e2, FM2_HL_e2_err)
1308     unset print
1309     replot
1310     pause plot_pause "FM2 HL TC"
1311   }
1312
1313   print sprintf("FM2_HET_HL_TC = 1.0 / (1 + T_HET1*(%.4g %+.4g*T_HET1))", FM2_HL_e1/100,
        FM2_HL_e2/1e6)
1314   do for [ci=1:HL_chN] {
1315       CH=HL_ch(ci)
1316       print sprintf("FM2_%s_calib = FM2_%sH_calib * %.3f * FM2_HET_HL_TC", CH, CH[1:3],
           ee0[ci])
1317   }
1318
1319   #       ##############################################################################################################

1320
1321   unset out
1322   set term pop
1323   unset print
```

3.9 FM room temperature Script

```
#! /usr/local/bin/gnuplot
# -*- gnuplot -*-

reset
unset print

plot_all = 0
fit_all = 0
plot_pause = 0

fn_base = "hetept_fm_cal_bi207"
resultfile = fn_base.".results"

fitlogfile = fn_base.".fit"

if (ARG1 eq "fit") {
  fit_all = 1
  plot_all = 1
  system("rm -f ".fitlogfile)
  if (ARG2 eq "pause") {
   plot_pause = -1
  }
}

if (ARG1[1:4] eq "plot") {
  reset
  fit_all = 0
  plot_all = 1
  if (ARG1 eq "plotthis") {plot_all = 0}
  plot_pause = 0
  plotext = ARG2[strlen(ARG2)-2:]
  if (plotext eq "png") {
   set out ARG2
   set term png size 1200,900
  }
  if (plotext eq ".ps") {
   set out ARG2
   set term postscript enhanced solid color
  }
  if (plotext eq "pdf") {
   set out ARG2
   set term pdf size 11.6in,8.2in
   set lmargin at screen 0.075
   set rmargin at screen 0.925
   set tmargin at screen 0.075
   set bmargin at screen 0.90
  }
}
if (ARG1 eq "print") {
  fit_all = 0
  plot_all = 0
  set print ARG2
}
if (ARG1[1:5] eq "pause") {
  fit_all = 0
  plot_all = 1
  if (ARG1 eq "pausethis") {plot_all = 0}
  plot_pause = -1
  if (ARG2 ne "") {
   plot_pause = ARG2+0
  }
}

set fit logfile fitlogfile
set fit results

load resultfile
if (fit_all) {
  system("mv ".resultfile." ".resultfile."~")
  set print resultfile
  print "# `date`"
  unset print
}

N=8
array FILENAME[N]
FILENAME[1] = "data/2016-09-20-fm1-Bi207-muon-postion1-nom-post-bakeout-2"
FILENAME[2] = "data/2016-09-26-fm1-Bi207-muon-postion2-nom-post-bakeout-1"
FILENAME[3] = "data/2016-09-28-fm1-Bi207-muon-postion3-nom-post-bakeout-1"
FILENAME[4] = "data/2016-09-27-fm1-Bi207-muon-postion4-nom-post-bakeout-1"
```

```
81  FILENAME[5] = "data/2016-08-09-fm2-Bi207-position1-muon-red-1"
82  FILENAME[6] = "data/2016-08-10-fm2-Bi207-position2-muon-red-1"
83  FILENAME[7] = "data/2016-09-07-fm2-Bi207-muon-postion3-nom-post-bakeout-1"
84  FILENAME[8] = "data/2016-09-08-fm2-Bi207-muon-postion4-nom-post-bakeout-1"
85  FILES=FILENAME[1]
86  do for [i=2:N] { FILES=FILES." ".FILENAME[i] }
87  array UNIT[N]
88  do for [i=1:N] { UNIT[i] = "FM".FILENAME[i][19:19] }
89  array POSITION[N] = [ 1,2,3,4,1,2,3,4 ]
90
91  array Temp[N]
92  do for [i=1:N] {
93    eval system(sprintf('awk "/HET1/{print \"Temp[%d]=\" \$7;exit}" %s.avg_temp', i,
        FILENAME[i][6:]))
94  }
95
96  CH=""
97  PRE(i) = UNIT[i]."_".POSITION[i]."_".CH
98  TIT(i) = sprintf("%s pos %d %.1f°C %s", UNIT[i], POSITION[i], Temp[i], CH)
99
100 mV = 9.772
101
102 I = 2
103
104 C4=I+22
105 A3=I+25
106 C3=I+24
107 A4=I+23
108 C2=I+26
109 A1=I+29
110 C1=I+28
111 A2=I+27
112
113 A11L=I+ 8
114 A11H=I+ 6
115 A12L=I+ 9
116 A12H=I+21
117
118 B11L=I+ 0
119 B11H=I+ 1
120 B12L=I+ 3
121 B12H=I+ 2
122 B13G=I+ 7
123
124 A21L=I+17
125 A21H=I+16
126 A22L=I+14
127 A22H=I+15
128
129 B21L=I+10
130 B21H=I+11
131 B22L=I+12
132 B22H=I+13
133 B23G=I+19
134
135 C1L=I+4
136 C1H=I+5
137 C2L=I+20
138 C2H=I+18
139
140 set samples 10000
141 set fit errorvar noerrorscaling
142
143 landau(l)=sqrt(exp(-l-exp(-l))/2/pi)
144 mips(a,e,s, x)=a*landau((x-e)/s)
145
146 array axI[N]
147 array exI[N]
148 array sxI[N]
149 array baI[N]
150 array bsI[N]
151 array acI[N]
152 array ecI[N]
153 array scI[N]
154 array bcaI[N]
155 array bcsI[N]
156 array aI[N]
157 array eI[N]
158 array sI[N]
159 array eI_err[N]
160
161 pk(a,e,s, x) = a*exp(-((x-e)/s)**2/2)
162 bg(a,e,s, x) = a*exp(-(x-e)/s)
```

```
163
164  keV75 = 74.969 # X-ray
165  keV73 = 72.805 # X-ray
166  keV84 = 84.45
167  keV85 = 84.938
168  keV87 = 87.3
169  keV58 = 57.962 # Comptom backscatter
170  keV57 = 56.660 # Comptom backscatter
171  keV393 = 393.306  # Comptom edge
172  keV858 = 857.6427 # Comptom edge
173  biX2(a,e,s, x) = pk(a*4.31,e*keV84,s, x) + pk(a*8.27,e*keV85,s, x)  + pk(a*3.02,e*keV87,
       s, x)
174  biB(a,e,s, ba,bs, x) = bg(ba,e*keV58,bs, x) + pk(a*35.7,e*keV58,s, x) + pk(a*23.7, e*
       keV57,s, x)
175  biX(a,e,s, ba,bs, x) = bg(ba,e*keV75,bs, x) + pk(a*35.7,e*keV75,s, x) + pk(a*23.7, e*
       keV73,s, x) + biX2(a*0.65,e,s, x)
176  biXB(a,e,s, ab,eb,sb, ba,bs, x) = biX(a,e,s, ba,bs, x) + biB(ab,eb,sb, 0,1, x)
177  CEdge(a,e,s, ba,bs, x) = bg(ba,e,bs, x)*(1+a/2/ba*erf(-(x-e)/s))
178  biC(a,e,s, ba,bs, x) = bg(ba,e*keV393,bs, x)*(1+a/2/ba*erf(-(x-e*keV393)/s))
179  biC2(a,e,s, ba,bs, x) = bg(ba,e*keV858,bs, x)*(1+a/2/ba*erf(-(x-e*keV858)/s))
180
181  CH="BB_C"  ###############################################################################
182
183  fn_bb_c(i) = FILENAME[i]."_BB_C.1dhist"
184
185  do for [i=1:N] {
186   eval sprintf('if(exists("%s_e")) { eI[%d]=%s_e } else { eI[%d]=900. }',
         PRE(i), i, PRE(i), i)
187   eval sprintf('if(exists("%s_a")) { aI[%d]=%s_a } else { aI[%d]=10.  }',
         PRE(i), i, PRE(i), i)
188   eval sprintf('if(exists("%s_s")) { sI[%d]=%s_s } else { sI[%d]=10.  }',
         PRE(i), i, PRE(i), i)
189   eval sprintf('if(exists("%s_e_err")) { eI_err[%d]=%s_e_err } else { eI_err[%d] = 0  }',
         PRE(i), i, PRE(i), i)
190  }
191
192  if (plot_all) {
193    set xra [500:2500]
194    unset log y
195    set yra [0:*]
196    set key enh
197    calstr(i) = sprintf('%s peak %5.0f width %.4f height %5.0f', TIT(i), eI[i], sI[i]/eI[i
       ], aI[i]*sI[i])
198    plot for [ii=1:N] fn_bb_c(ii) tit calstr(ii) with histeps lt ii, \
199         for [ii=1:N] mips(aI[ii], eI[ii], sI[ii], x) not w l lt ii
200    pause plot_pause CH
201  }
202  if (fit_all) {
203    set print resultfile append
204    do for [i=1:N] {
205     e=eI[i]; a=aI[i]; s=sI[i];
206     fit [0.75*e:1.8*e] mips(a,e,s, x) fn_bb_c(i) using 1:2:(sqrt($2+3)) zerror via a,e,s
207     eI[i]=e; aI[i]=a; sI[i]=s; eI_err[i]=e_err;
208     print sprintf("%s_e  = %10.6g; %s_e_err  = %10.6g # %.2f °C", PRE(i), e, PRE(i),
          e_err, Temp[i])
209     print sprintf("%s_a  = %10.6g; %s_a_err  = %10.6g # %.2f °C", PRE(i), a, PRE(i),
          a_err, Temp[i])
210     print sprintf("%s_s  = %10.6g; %s_s_err  = %10.6g # %.2f °C", PRE(i), s, PRE(i),
          s_err, Temp[i])
211     replot
212     pause plot_pause calstr(i)
213    }
214    unset print
215  }
216
217  if (plot_all) {
218    set key enh
219    set xra [*:*]
220    unset log y
221    set yra [*:*]
222    set xlab "Temperature"
223    set format x "%.0f°C"
224    unset y2tics
225    unset x2tics
226    unset x2lab
227    plot for [uu in "FM1 FM2"] Temp u (UNIT[$1] eq uu ? $2 : NaN):(eI[$1]):(eI_err[$1])
         tit uu with errorbars lw 2
228    pause plot_pause CH." vs Temp"
229  }
230
231  # EPT X-rays  ##################################################################
232
233  fn_xrays(i) = FILENAME[i]."_xrays.hist"
```

```
234
235  ax  = 44
236  ex  = 0.1
237  sx  = 0.3
238  ba  = 15
239  bs  = 3
240
241  bca = 25
242  bcs = 15
243  ac  = 28
244  ec  = 0.1
245  sc  = 0.8
246
247
248  do for [i=1:N] {
249  axI[i]  = ax
250  exI[i]  = ex
251  sxI[i]  = sx
252  baI[i]  = ba
253  bsI[i]  = bs
254  bcaI[i] = bca
255  bcsI[i] = bcs
256  acI[i]  = ac
257  ecI[i]  = ec
258  scI[i]  = sc
259  }
260
261  fI(I, x) = biXB(axI[I], exI[I], sxI[I], axI[I]/5, exI[I]*1.05, exI[I]*6, baI[I], bsI[I],
         x) + 0.5
262  f(x)     =  biXB(ax,     ex,     sx,     ax/5,     ex*1.05,     ex*6,     ba,     bs,
         x) + 0.5
263
264  EPT_pos =  "1 2 3 4 5 6"
265
266  do for [CH in "C1 C2 C3 C4 A1 A2 A3 A4"] {
267
268   eval "CHI = ".CH
269
270   do for [i=1:N] {
271    eval sprintf('if(exists("%s_ax"))  { axI[%d] = %s_ax }',  PRE(i), i, PRE(i))
272    eval sprintf('if(exists("%s_ex"))  { exI[%d] = %s_ex }',  PRE(i), i, PRE(i))
273    eval sprintf('if(exists("%s_sx"))  { sxI[%d] = %s_sx }',  PRE(i), i, PRE(i))
274    eval sprintf('if(exists("%s_ba"))  { baI[%d] = %s_ba }',  PRE(i), i, PRE(i))
275    eval sprintf('if(exists("%s_bs"))  { bsI[%d] = %s_bs }',  PRE(i), i, PRE(i))
276   }
277   if (plot_all) {
278    set log y
279    set yra [1:*]
280    set xra [0:20]
281    set x2tics
282    set x2ra [0:20/exI[1]]
283    calstr(i) = sprintf('%s X-ray: %6.4f mV/keV, σ %5.2f keV', TIT(i), exI[i]*mV, sxI[i]/
         exI[i])
284    plot for [iix in EPT_pos] fn_xrays(0+iix) u 1:CHI  tit calstr(0+iix)  with histeps lt
         0+iix lw 2, \
285        for [iix in EPT_pos] fI(0+iix,x) notit with lines lt 0+iix
286    pause plot_pause "X-rays ".CH
287    }
288
289   x1 = 4
290   if (CH[1:1] eq 'A') { x1=6.5 }
291   x2 = 12
292   if (fit_all) {
293    set print resultfile append
294    do for [ix in EPT_pos] {
295     i=0+ix
296     ax=axI[i];ex=exI[i];sx=sxI[i];ba=baI[i];bs=bsI[i]
297     fit [x1:x2] [*:*] f(x) fn_xrays(i) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba
298     if (ba+ax>10) {
299     fit [x1:x2] [*:*] f(x) fn_xrays(i) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba,
          sx, bs, ex
300     } else {
301     ax_err=0;ex_err=0;sx_err=0;ba_err=0;bs_err=0
302     }
303     axI[i]=ax;exI[i]=ex;sxI[i]=sx;baI[i]=ba;bsI[i]=bs
304     print sprintf("%s_ax = %10.6g; %s_ax_err = %10.6g", PRE(i), ax , PRE(i), ax_err)
305     print sprintf("%s_ex = %10.6g; %s_ex_err = %10.6g", PRE(i), ex , PRE(i), ex_err)
306     print sprintf("%s_sx = %10.6g; %s_sx_err = %10.6g", PRE(i), sx , PRE(i), sx_err)
307     print sprintf("%s_ba = %10.6g; %s_ba_err = %10.6g", PRE(i), ba , PRE(i), ba_err)
308     print sprintf("%s_bs = %10.6g; %s_bs_err = %10.6g", PRE(i), bs , PRE(i), bs_err)
309     set x2ra [0:20/exI[i]]
310     replot
311     pause plot_pause calstr(i)
```

```
312       }
313     unset print
314     }
315   }
316
317   # EPT Compton edge ###############################################################
318
319   fI(I, x) = biC(acI[I], ecI[I], scI[I], bcaI[I], bcsI[I],  x) + 0.5
320   f(x)     = biC(ac,     ec,     sc,     bca,     bcs,      x) + 0.5
321
322   #EPT_pos = "1 2 3 4 5 6 7 8"
323   EPT_pos = "2 6"
324
325   do for [CH in "C1 C2 C3 C4 A1 A2 A3 A4"] {
326
327     eval "CHI = ".CH
328
329     do for [i=1:N] {
330       eval sprintf('if(exists("%s_ac"))  { acI[%d] = %s_ac }',    PRE(i), i, PRE(i))
331       eval sprintf('if(exists("%s_ec"))  { ecI[%d] = %s_ec }',    PRE(i), i, PRE(i))
332       eval sprintf('if(exists("%s_sc"))  { scI[%d] = %s_sc }',    PRE(i), i, PRE(i))
333       eval sprintf('if(exists("%s_bca")) { bcaI[%d] = %s_bca }',  PRE(i), i, PRE(i))
334       eval sprintf('if(exists("%s_bcs")) { bcsI[%d] = %s_bcs }',  PRE(i), i, PRE(i))
335     }
336     if (plot_all) {
337       set log y
338       set yra [1:*]
339       set xra [20:60]
340       set x2ra [20/ecI[2]:60/ecI[2]]
341       calstr(i) = sprintf('%s Compton: %6.4f mV/keV, σ %5.2f keV', TIT(i), ecI[i]*mV, scI[i
            ]/ecI[i])
342       plot for [iix in EPT_pos] fn_xrays(0+iix) u 1:CHI tit calstr(0+iix) with histeps lt 0+
            iix lw 2, \
343            for [iix in EPT_pos] fI(0+iix,x) notit with lines lt 0+iix
344       pause plot_pause "Compton ".CH
345       }
346
347     x1 = 20
348     x2 = 50
349
350     if (fit_all) {
351       set print resultfile append
352       do for [ix in EPT_pos] {
353         i=0+ix
354         bca=bcaI[i];bcs=bcsI[i];ac=acI[i];ec=ecI[i];sc=scI[i]
355         fit [x1:x2] [*:*] f(x) fn_xrays(i) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca
356         if (bca>3) {
357         fit [x1:x2] [*:*] f(x) fn_xrays(i) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca,
                bcs, ec
358         fit [x1:x2] [*:*] f(x) fn_xrays(i) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca,
              sc, bcs, ec
359         } else {
360            bca_err=0;bcs_err=0;ac_err=0;ec_err=0;sc_err=0;
361         }
362         bcaI[i]=bca;bcsI[i]=bcs;acI[i]=ac;ecI[i]=ec;scI[i]=sc;
363         print sprintf("%s_ac = %10.6g; %s_ac_err = %10.6g", PRE(i), ac , PRE(i), ac_err)
364         print sprintf("%s_ec = %10.6g; %s_ec_err = %10.6g", PRE(i), ec , PRE(i), ec_err)
365         print sprintf("%s_sc = %10.6g; %s_sc_err = %10.6g", PRE(i), sc , PRE(i), sc_err)
366         print sprintf("%s_bca = %10.6g; %s_bca_err = %10.6g", PRE(i), bca , PRE(i), bca_err)
367         print sprintf("%s_bcs = %10.6g; %s_bcs_err = %10.6g", PRE(i), bcs , PRE(i), bcs_err)
368         set x2ra [20/ecI[i]:60/ecI[i]]
369         replot
370         pause plot_pause calstr(i)
371         }
372       unset print
373     }
374
375     do for [ix in EPT_pos] {
376       i=0+ix
377       print sprintf("%s_%s_calib2 = %.3f # EPT compton pos %d", UNIT[i], CH, 1/mV/ecI[i],
            POSITION[i])
378     }
379   }
380
381   # HET X-rays  ####################################################################
382
383   fn_xrays(i) = FILENAME[i]."_xrays.hist"
384
385   ax  = 44
386   ex  = 5.7/75
387   sx  = 0.3
388   ba  = 15
389   bs  = 3
```

```
390
391   bca = 25
392   bcs = 15
393   ac  = 28
394   ec  = ex
395   sc  = 0.8
396
397
398   do for [i=1:N] {
399   axI[i]  = ax
400   exI[i]  = ex
401   sxI[i]  = sx
402   baI[i]  = ba
403   bsI[i]  = bs
404   bcaI[i] = bca
405   bcsI[i] = bcs
406   acI[i]  = ac
407   ecI[i]  = ec
408   scI[i]  = sc
409   }
410
411   fI(I, x) = biXB(axI[I], exI[I], sxI[I], axI[I]/5, exI[I]*1.05, exI[I]*6, baI[I], bsI[I],
          x) + 0.5
412   f(x)     =  biXB(ax,     ex,     sx,     ax/5,     ex*1.05,     ex*6,     ba,     bs,
          x) + 0.5
413
414   array HET_pos[31]
415   HET_pos[A11H] = "4 5 1 2 3 6"
416   HET_pos[A12H] = "4 5 1 2 3 6"
417   HET_pos[A21H] = "3 5 1 2 4 6"
418   HET_pos[A22H] = "3 5 1 2 4 6"
419   HET_pos[B11H] = "4 6 2"
420   HET_pos[B12H] = "4 6 2"
421   HET_pos[B21H] = "3 6"
422   HET_pos[B22H] = "3 6"
423
424
425   HET_all =  "1 2 3 4 5 6"
426
427   do for [CH in "A11H A12H A21H A22H B11H B12H B21H B22H"] {
428
429    eval "CHI = ".CH
430
431    do for [i=1:N] {
432     eval sprintf('if(exists("%s_ax"))  { axI[%d] = %s_ax }',  PRE(i), i, PRE(i))
433     eval sprintf('if(exists("%s_ex"))  { exI[%d] = %s_ex }',  PRE(i), i, PRE(i))
434     eval sprintf('if(exists("%s_sx"))  { sxI[%d] = %s_sx }',  PRE(i), i, PRE(i))
435     eval sprintf('if(exists("%s_ba"))  { baI[%d] = %s_ba }',  PRE(i), i, PRE(i))
436     eval sprintf('if(exists("%s_bs"))  { bsI[%d] = %s_bs }',  PRE(i), i, PRE(i))
437    }
438    if (plot_all) {
439     set log y
440     set yra [100:*]
441     set xra [0:15]
442     set x2tics
443     set x2ra [0:15/exI[1]]
444     calstr(i) = sprintf('%s X-ray: %6.4f mV/keV, σ %5.2f keV', TIT(i), exI[i]*mV, sxI[i]/
          exI[i])
445     plot for [iix in HET_pos[CHI]] fn_xrays(0+iix) u 1:CHI  tit calstr(0+iix)  with
          histeps lt 0+iix lw 2, \
446        for [iix in HET_pos[CHI]] fI(0+iix,x) notit with lines lt 0+iix
447     pause plot_pause "X-rays ".CH
448     }
449
450    x1 = 3.5
451    x2 = 10
452    if (fit_all) {
453     set print resultfile append
454     do for [ix in HET_pos[CHI]] {
455      i=0+ix
456      ax=axI[i];ex=exI[i];sx=sxI[i];ba=baI[i];bs=bsI[i]
457      fit [x1:x2] [*:*] f(x) fn_xrays(i) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba
458      if (ba+ax>10) {
459      fit [x1:x2] [*:*] f(x) fn_xrays(i) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ax, ba,
          sx, bs, ex
460      } else {
461      ax_err=0;ex_err=0;sx_err=0;ba_err=0;bs_err=0
462      }
463      axI[i]=ax;exI[i]=ex;sxI[i]=sx;baI[i]=ba;bsI[i]=bs
464      print sprintf("%s_ax = %10.6g; %s_ax_err = %10.6g", PRE(i), ax , PRE(i), ax_err)
465      print sprintf("%s_ex = %10.6g; %s_ex_err = %10.6g", PRE(i), ex , PRE(i), ex_err)
466      print sprintf("%s_sx = %10.6g; %s_sx_err = %10.6g", PRE(i), sx , PRE(i), sx_err)
467      print sprintf("%s_ba = %10.6g; %s_ba_err = %10.6g", PRE(i), ba , PRE(i), ba_err)
```

```
468       print sprintf("%s_bs = %10.6g; %s_bs_err = %10.6g", PRE(i), bs , PRE(i), bs_err)
469       set x2ra [0:20/exI[i]]
470       replot
471       pause plot_pause calstr(i)
472       }
473     unset print
474     }
475   }
476
477   # HET Compton edge ###################################################################
478
479   fI(I, x) = biC(acI[I], ecI[I], scI[I], bcaI[I], bcsI[I],  x) + 0.5
480   f(x)     = biC(ac,     ec,     sc,     bca,     bcs,      x) + 0.5
481
482   HET_pos[A11H] = "2 6 1 3 4 5"
483   HET_pos[A12H] = "2 6 1 3 4 5"
484   HET_pos[A21H] = "1 6 2 3 4"
485   HET_pos[A22H] = "1 5 2 3 4 6"
486   HET_pos[B11H] = "1 5 2 3 4 6"
487   HET_pos[B12H] = "1 5 2 3 4 6"
488   HET_pos[B21H] = "1 5 2 4 6"
489   HET_pos[B22H] = "1 5 2 3 4 6"
490
491   do for [CH in "A11H A12H A21H A22H B11H B12H B21H B22H"] {
492
493     eval "CHI = ".CH
494
495     do for [i=1:N] {
496       eval sprintf('if(exists("%s_ac"))  { acI[%d] = %s_ac }',    PRE(i), i, PRE(i))
497       eval sprintf('if(exists("%s_ec"))  { ecI[%d] = %s_ec }',    PRE(i), i, PRE(i))
498       eval sprintf('if(exists("%s_sc"))  { scI[%d] = %s_sc }',    PRE(i), i, PRE(i))
499       eval sprintf('if(exists("%s_bca")) { bcaI[%d] = %s_bca }',  PRE(i), i, PRE(i))
500       eval sprintf('if(exists("%s_bcs")) { bcsI[%d] = %s_bcs }',  PRE(i), i, PRE(i))
501     }
502     if (plot_all) {
503       set log y
504       set yra [1:*]
505       set xra [20:40]
506       set x2ra [20/ecI[2]:40/ecI[2]]
507       calstr(i) = sprintf('%s Compton: %6.4f mV/keV, σ %5.2f keV', TIT(i), ecI[i]*mV, scI[i
            ]/ecI[i])
508       plot for [iix in HET_pos[CHI]] fn_xrays(0+iix) u 1:CHI tit calstr(0+iix) with histeps
            lt 0+iix lw 2, \
509           for [iix in HET_pos[CHI]] fI(0+iix,x) notit with lines lt 0+iix
510       pause plot_pause "Compton ".CH
511       }
512
513     x1 = 20
514     x2 = 38
515
516     if (fit_all) {
517       set print resultfile append
518       do for [ix in HET_pos[CHI]] {
519         i=0+ix
520         bca=bcaI[i]; bcs=bcsI[i]; ac=acI[i]; ec=ecI[i]; sc=scI[i]
521         fit [x1:x2] [*:*] f(x) fn_xrays(i) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca
522         if (bca>3) {
523         fit [x1:x2] [*:*] f(x) fn_xrays(i) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca,
              bcs, ec
524         fit [x1:x2] [*:*] f(x) fn_xrays(i) u 1:CHI:(sqrt(column(CHI)+1)) zerror via ac, bca,
            sc, bcs, ec
525         } else {
526           bca_err=0; bcs_err=0; ac_err=0; ec_err=0; sc_err=0;
527         }
528         bcaI[i]=bca; bcsI[i]=bcs; acI[i]=ac; ecI[i]=ec; scI[i]=sc;
529         print sprintf("%s_ac = %10.6g; %s_ac_err = %10.6g", PRE(i), ac , PRE(i), ac_err)
530         print sprintf("%s_ec = %10.6g; %s_ec_err = %10.6g", PRE(i), ec , PRE(i), ec_err)
531         print sprintf("%s_sc = %10.6g; %s_sc_err = %10.6g", PRE(i), sc , PRE(i), sc_err)
532         print sprintf("%s_bca = %10.6g; %s_bca_err = %10.6g", PRE(i), bca , PRE(i), bca_err)
533         print sprintf("%s_bcs = %10.6g; %s_bcs_err = %10.6g", PRE(i), bcs , PRE(i), bcs_err)
534         set x2ra [20/ecI[i]:60/ecI[i]]
535         replot
536         pause plot_pause calstr(i)
537         }
538       unset print
539     }
540
541     do for [ix=1:2] {
542       i= 0+word(HET_pos[CHI], ix)
543       print sprintf("%s_%s_calib2 = %.3f # HET compton pos %d", UNIT[i], CH, 1/mV/ecI[i],
            POSITION[i])
544     }
545   }
```

```
546
547  array NAMES[30]
548  NAMES[ 1] = 'B11L'
549  NAMES[ 2] = 'B11H'
550  NAMES[ 3] = 'B12H'
551  NAMES[ 4] = 'B12L'
552  NAMES[ 5] = 'C1L'
553  NAMES[ 6] = 'C1H'
554  NAMES[ 7] = 'A11H'
555  NAMES[ 8] = 'B13G'
556  NAMES[ 9] = 'A11L'
557  NAMES[10] = 'A12L'
558  NAMES[11] = 'B21L'
559  NAMES[12] = 'B21H'
560  NAMES[13] = 'B22L'
561  NAMES[14] = 'B22H'
562  NAMES[15] = 'A22L'
563  NAMES[16] = 'A22H'
564  NAMES[17] = 'A21H'
565  NAMES[18] = 'A21L'
566  NAMES[19] = 'C2H'
567  NAMES[20] = 'B23G'
568  NAMES[21] = 'C2L'
569  NAMES[22] = 'A12H'
570  NAMES[23] = 'C4'
571  NAMES[24] = 'A4'
572  NAMES[25] = 'C3'
573  NAMES[26] = 'A3'
574  NAMES[27] = 'C2'
575  NAMES[28] = 'A2'
576  NAMES[29] = 'C1'
577  NAMES[30] = 'A1'
578
579
580  if (1+plot_all) {
581   plot [] [*:*] \
582    for [ix=23:30] "<grep -hi fm1 2016-10*.results | grep ".NAMES[ix]."_e[xc]" u ($6
       <0.005&&$8>18&&$8<32?ix:NaN):3:6 w errorbars lt ix pt 1, \
583    for [ix=23:30] "<grep -hi fm1 hetept*.results | grep ".NAMES[ix]."_e[c]" u ($6<0.005?
       ix:NaN):3:6 w errorbars lt ix pt 7 ps 2
584   pause plot_pause "FM1 EPT"
585   plot [] [*:*] \
586    for [ix=23:30] "<grep -hi fm2 2016-10*.results | grep ".NAMES[ix]."_e[xc]" u ($6
       <0.005&&$8>18&&$8<32?ix:NaN):3:6 w errorbars lt ix pt 1, \
587    for [ix=23:30] "<grep -hi fm2 hetept*.results | grep ".NAMES[ix]."_e[c]" u ($6<0.005?
       ix:NaN):3:6 w errorbars lt ix pt 7 ps 2
588   pause plot_pause "FM2 EPT"
589   HET_HG = "2 3 7 12 14 16 17 22"
590   plot [] [*:*] \
591    for [ix in HET_HG] "<grep -hi fm1 2016-10*.results | grep ".NAMES[0+ix]."_e[xc]" u ($6
       <0.005&&$8>18&&$8<32?0+ix:NaN):3:6 w errorbars lt 0+ix pt 1, \
592    for [ix in HET_HG] "<grep -hi fm1 hetept*.results | grep ".NAMES[0+ix]."_e[c]" u ($6
       <0.005?0+ix:NaN):3:6 w errorbars lt 0+ix pt 7 ps 2
593   pause plot_pause "FM1 HET"
594   plot [] [*:*] \
595    for [ix in HET_HG] "<grep -hi fm2 2016-10*.results | grep ".NAMES[0+ix]."_e[xc]" u ($6
       <0.005&&$8>18&&$8<32?0+ix:NaN):3:6 w errorbars lt 0+ix pt 1, \
596    for [ix in HET_HG] "<grep -hi fm2 hetept*.results | grep ".NAMES[0+ix]."_e[c]" u ($6
       <0.005?0+ix:NaN):3:6 w errorbars lt 0+ix pt 7 ps 2
597   pause plot_pause "FM2 HET"
598  }
```