5.1.12 SENSITIVITY

5.1.12.1 NAC FM SENSITIVITY CALIBRATION RESULTS

As reported in Reference 5.1.12.1-1

Reference 5.1.12.1-1 - IOM 388-PAG-CCA97-8, "NAC FM Calibration Results: Sensitivity", C. Avis, March 12, 1997

Reference 5.1.12.1-2 - IOM 387-ER-97-628,"Cassini ISS Data Conversion/Transmission Factors", E. Romo March 12, 1997

5.1.12.1.1 INTRODUCTION

The Narrow-angle Flight Model thermal/vacuum testing included the acquisition of a set of images for determination of the system gain and sensitivity. The term 'sensitivity' describes the number of DN produced per unit of energy input into the system . The image data were taken at temperatures of +25° and +5° C in all gain states and antiblooming modes.

5.1.12.1.2 METHOD

For this camera system, the DN resulting from an exposure may be described by the following equation.

$$DN = VL(T - t_0) + DC_T + DN_0$$

where
- DN is the measured pixel value
- V is the system sensitivity (in DN/radiance_unit-milliseconds)
- L is the measured radiance (in arbitrary radiance_units)
- T is the commanded exposure time (in milliseconds)
- t_0 is the known shutter-offset (a function of image sample number, in msec)
- DN_0 is the video offset or bias level (in DN)
- DC_T is the dark-current level (a function of exposure time, in DN)

Analysis so far of DC_T indicates that for the exposure used here (maximum of 1000 msec), this value should be less than one DN. Therefore, the above equation is simplified to

$$DN = VL(T - t_0) + DN_0$$

Because the shutter-offset was previously derived, only V and DN_0 need to be solved for. DN_0 could be measured by zero-exposure images, but it falls out of the least-squares fit anyway.

Images at the same signal level are combined to produce signal and energy values at 100 small areas at all available signal levels. Energy values come from the product of the exposure time (corrected for shutter-offset) and the radiance of the source. Values for Sensitivity and the Bias level are then derived at each of these small areas independently. This is done by solving the above equation using least-squares.

The 100 derived values are then compared and any areas giving values more than 2 sigma from the mean are flagged as bad. Global values for V and DN_0 are then derived by averaging the values at the remaining good areas.

5.1.12.1.3 RESULTS

The following tables report the best fit Sensitivity and the Bias level. The results are given for the corner regions, the center and for the whole frame. The calibration equipment quantified the light produced by the source in units of picoamps. Therefore, the Sensitivity values below are given in units of DN/picoamp-msec and the Bias level is in units of DN. These values have not been corrected to account for the transmission of the chamber window.

4X4 GAIN=0 ANTIBLOOMING = OFF TEMPERATURE = +°C25	SENSITIVITY	SIGMA	BIAS	SIGMA
UPPER-LEFT	0.017868	0.000051	44.177	0.983
UPPER-RIGHT	0.017839	0.000077	47.731	0.471
LOWER-LEFT	0.017484	0.000078	43.411	0.753
LOWER-RIGHT	0.017464	0.000040	46.926	0.398
CENTER	0.017665	0.000127	45.780	1.060
FULL FRAME	0.017682	0.000169	45.680	1.600

2X2 GAIN=1 ANTIBLOOMING = OFF TEMPERATURE = +°C25	SENSITIVITY	SIGMA	BIAS	SIGMA
UPPER-LEFT	0.009883	0.000032	115.653	0.485
UPPER-RIGHT	0.009873	0.000049	117.349	0.192
LOWER-LEFT	0.009666	0.000040	115.049	0.364
LOWER-RIGHT	0.009669	0.000032	116.618	0.258
CENTER	0.009787	0.000070	116.355	0.590
FULL FRAME	0.009783	0.000097	116.289	0.804

1X1 GAIN=2 ANTIBLOOMING = OFF TEMPERATURE = +°C25	SENSITIVITY	SIGMA	BIAS	SIGMA
UPPER-LEFT	0.008436	0.000017	28.107	0.358
UPPER-RIGHT	0.008421	0.000042	29.577	0.251
LOWER-LEFT	0.008243	0.000025	28.911	0.669
LOWER-RIGHT	0.008249	0.000031	30.227	0.347
CENTER	0.008360	0.000061	29.126	0.526
FULL FRAME	0.008343	0.000083	29.236	0.734

1X1 GAIN=2 ANTIBLOOMING = ON TEMPERATURE = +°C25	SENSITIVITY	SIGMA	BIAS	SIGMA
UPPER-LEFT	0.008415	0.000017	27.623	0.335
UPPER-RIGHT	0.008400	0.000042	29.122	0.254
LOWER-LEFT	0.008220	0.000027	28.535	0.748
LOWER-RIGHT	0.008229	0.000032	29.900	0.369
CENTER	0.008342	0.000061	28.708	0.595
FULL FRAME	0.008323	0.000084	28.825	0.790

1X1 GAIN=3 ANTIBLOOMING = OFF TEMPERATURE = +°C25	SENSITIVITY	SIGMA	BIAS	SIGMA
UPPER-LEFT	0.017626	0.000037	56.089	0.516
UPPER-RIGHT	0.017592	0.000091	59.262	0.486
LOWER-LEFT	0.017227	0.000068	59.066	1.694
LOWER-RIGHT	0.017240	0.000064	61.824	0.914
CENTER	0.017465	0.000129	58.631	1.421
FULL FRAME	0.017433	0.000173	58.979	1.866

4X4 GAIN=0 ANTIBLOOMING = ON TEMPERATURE = ºC 5	SENSITIVITY	SIGMA	BIAS	SIGMA
UPPER-LEFT	0.017512	0.000127	60.797	2.474
UPPER-RIGHT	0.017497	0.000103	62.637	0.425
LOWER-LEFT	0.017116	0.000080	58.581	0.851
LOWER-RIGHT	0.017074	0.000041	61.725	0.284
CENTER	0.017249	0.000139	60.956	1.470
FULL FRAME	0.017289	0.000197	60.879	1.859

2X2 GAIN=1 ANTIBLOOMING = ON TEMPERATURE = ºC 5	SENSITIVITY	SIGMA	BIAS	SIGMA
UPPER-LEFT	0.010307	0.000043	114.873	0.510
UPPER-RIGHT	0.010280	0.000058	116.496	0.294
LOWER-LEFT	0.010089	0.000039	113.624	0.298
LOWER-RIGHT	0.010072	0.000027	115.274	0.311
CENTER	0.010186	0.000069	115.236	0.705
FULL FRAME	0.010187	0.000099	115.147	0.950

1X1 GAIN=2 ANTIBLOOMING = ON TEMPERATURE = ºC 5	SENSITIVITY	SIGMA	BIAS	SIGMA
UPPER-LEFT	0.008424	0.000022	38.976	0.323
UPPER-RIGHT	0.008395	0.000048	40.117	0.296
LOWER-LEFT	0.008232	0.000023	39.265	0.654
LOWER-RIGHT	0.008227	0.000024	40.360	0.361
CENTER	0.008328	0.000060	39.549	0.479
FULL FRAME	0.008319	0.000081	39.668	0.622

1X1 GAIN=3 ANTIBLOOMING = ON TEMPERATURE = ºC 5	SENSITIVITY	SIGMA	BIAS	SIGMA
UPPER-LEFT	0.019836	0.000053	69.731	0.668
UPPER-RIGHT	0.019769	0.000113	72.732	0.647
LOWER-LEFT	0.019399	0.000068	71.555	1.622
LOWER-RIGHT	0.019381	0.000053	74.359	0.706
CENTER	0.019606	0.000143	71.902	1.195
FULL FRAME	0.019590	0.000188	72.097	1.607

The Thermal/Vacuum chamber window blocks some of the input energy. Therefore, the above numbers must be adjusted for the transmission of the window. The mean transmission for the range 408 to 898 nm is 0.93227. The available data doesn't extend past 898 nm whereas the bandpass for the CL1/CL2 filter combination is 400 to 1100 nm. The Sensitivity values corrected for the transmission of the window are reported below for the full-frame case.

		+25°C		+5°C	
Gain	Mode	Anti-blooming	Sensitivity (DN / picoamp-msec)	Anti-blooming	Sensitivity (DN / picoamp-msec)
0	4X4	OFF	0.01897 ± 0.00018	ON	0.01855 ± 0.00021
1	2X2	OFF	0.01049 ± 0.00010	ON	0.01093 ± 0.00011
2	1X1	OFF	0.00895 ± 0.00009		
2	1X1	ON	0.00893 ± 0.00009	ON	0.00892 ± 0.00009
3	1X1	OFF	0.01870 ± 0.00019	ON	0.02101 ± 0.00020

Proper use of the factors reported in Reference 5.1.12.1-2 can convert these values into physically meaningful units such as DN/nanowatt-msec/cm^2/sr/nm.

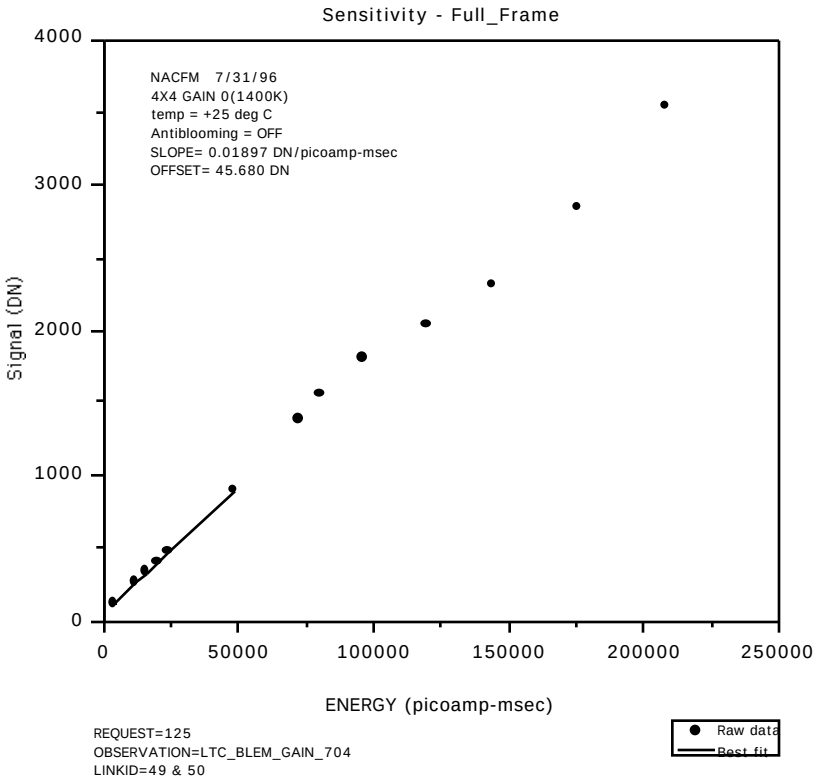
Notes:

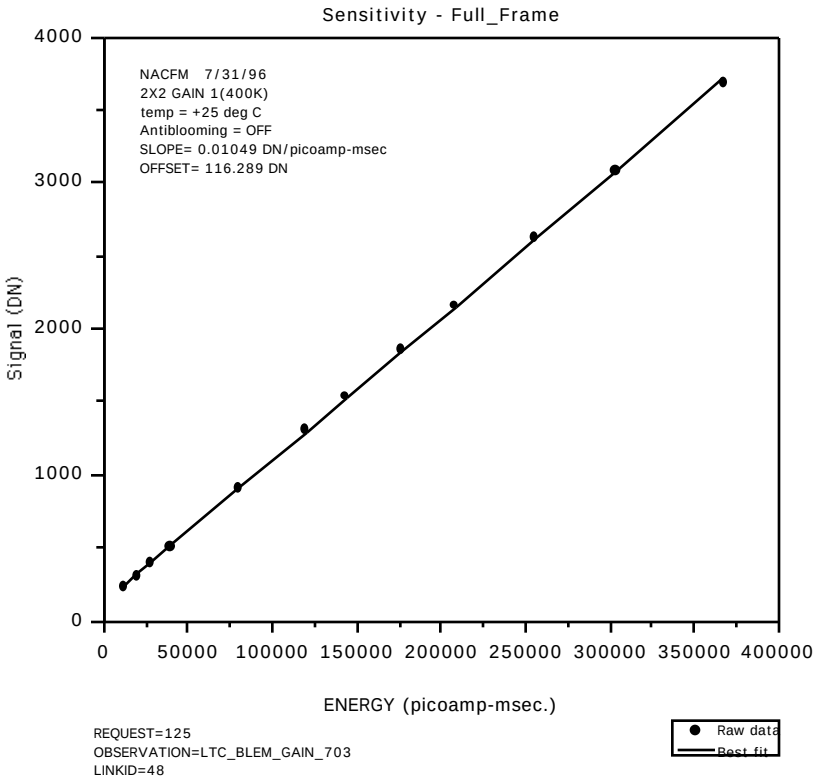
1. Due to linearity problems, the results for Gain 0 were calculated using exposure times of 0 to 70 milliseconds only.
2. Radiance was set at 800.0 picoamps for all tests.

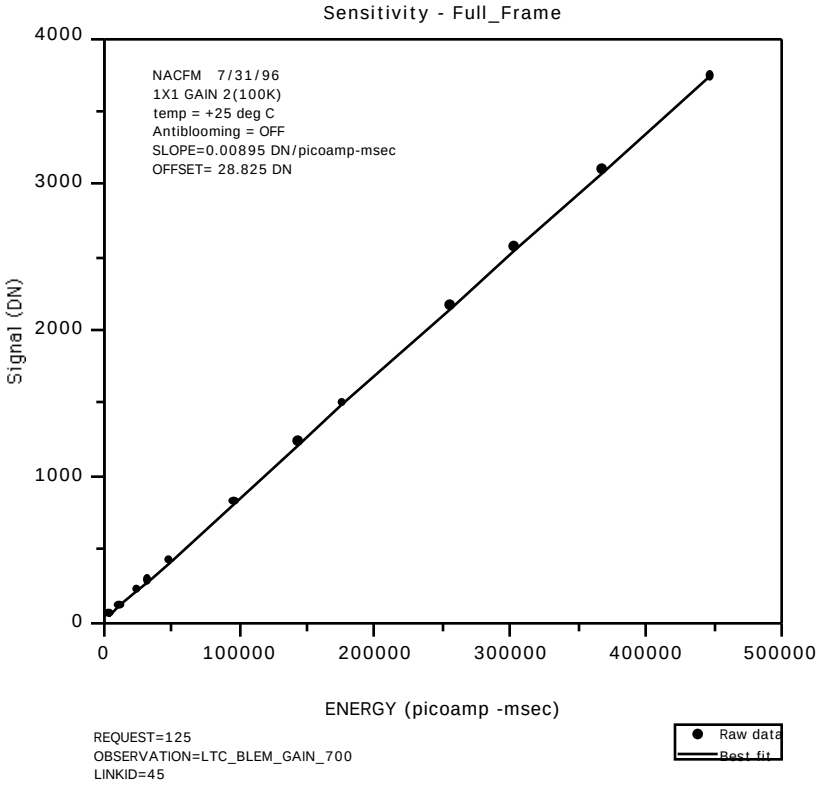
5.1.12.1.4 CONCLUSIONS

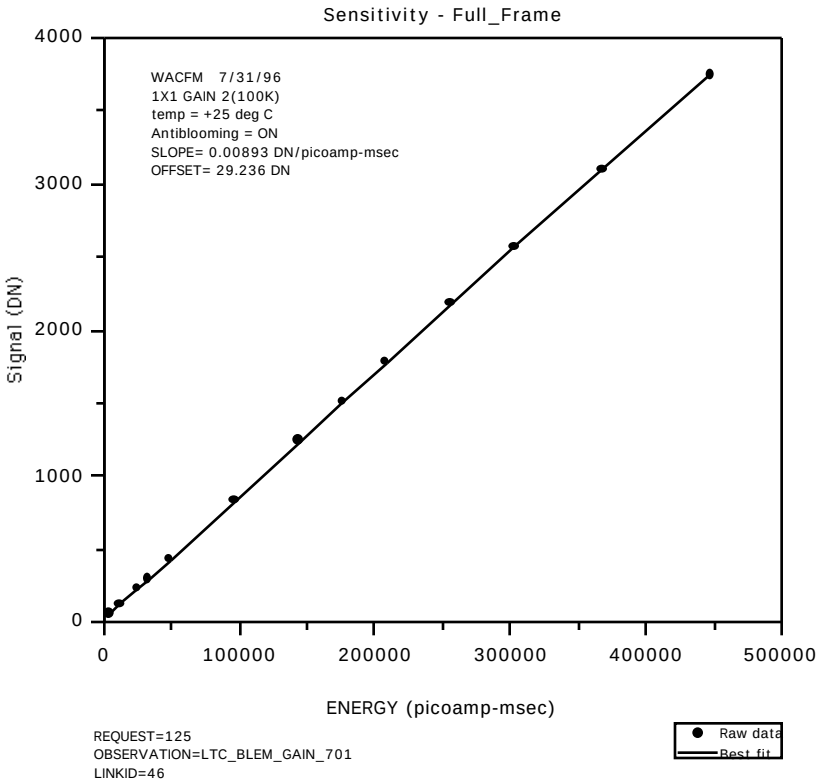
1. Regardless of the fact that Gain 0 (4x4 mode) has the weird oscillations above about 1000 DN in the Signal vs. Noise plot, the Signal vs. Energy (or exposure) curve continues to rise (although with a kink in the middle).
2. Gain state 0 (4x4 mode) for temperature of 5°C was calculated using only the first two exposure levels because of oscillations and the few exposures at this temperature. Therefore, this result might be suspect.
3. The use of Antiblooming mode had no effect on the sensitivity slope for Gain 2.
4. There is no significant difference in behavior at the two test temperatures.

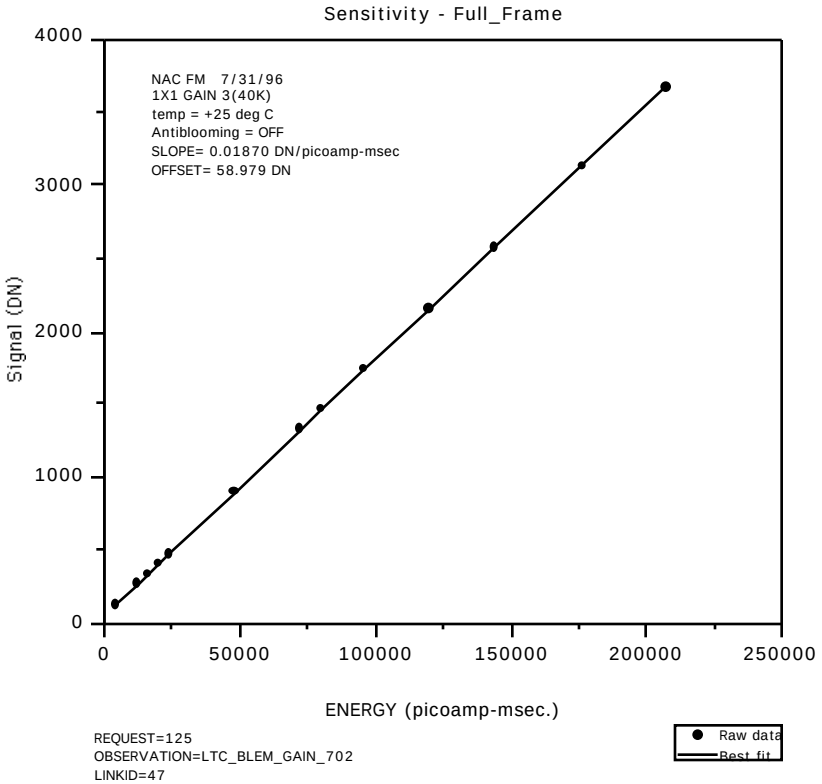
The following plots show the measurements of the signal as a function of input energy. The best linear fit to the points is shown by the plotted line. The points along the plotted line were used in the fit. Those past the line were ignored for determination of the slope.

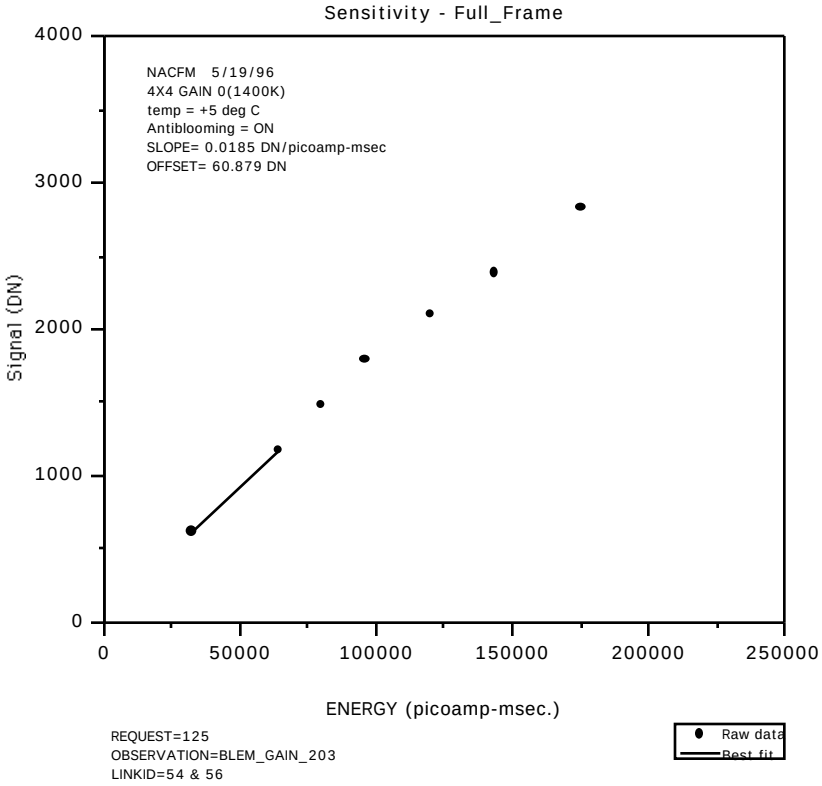

Sensitivity - Full_Frame
NACFM 7/31/96
4X4 GAIN 0(1400K)
temp = +25 deg C
Antiblooming = OFF
SLOPE= 0.01897 DN/picoamp-msec
OFFSET= 45.680 DN
Signal (DN)
4000
3000
2000
1000
0
0
50000
100000
150000
200000
250000
ENERGY (picoamp-msec)
Raw data
Best fit
REQUEST=125
OBSERVATION=LTC_BLEM_GAIN_704
LINKID=49 & 50

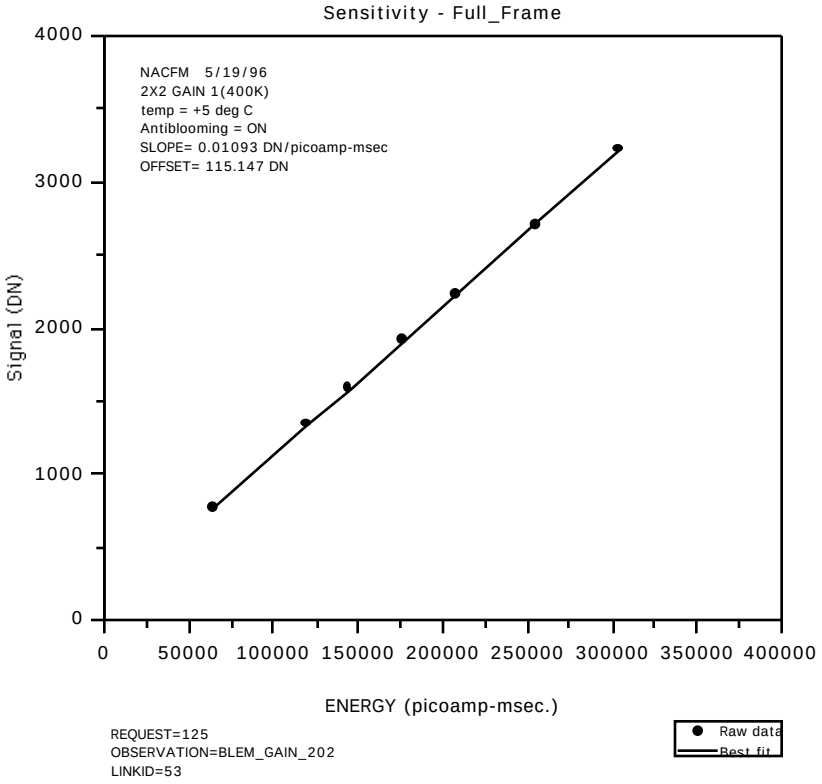

Sensitivity - Full_Frame
NACFM 7/31/96
2X2 GAIN 1(400K)
temp = +25 deg C
Antiblooming = OFF
SLOPE= 0.01049 DN/picoamp-msec
OFFSET= 116.289 DN
Signal (DN)
ENERGY (picoamp-msec.)
Raw data
Best fit
REQUEST=125
OBSERVATION=LTC_BLEM_GAIN_703
LINKID=48

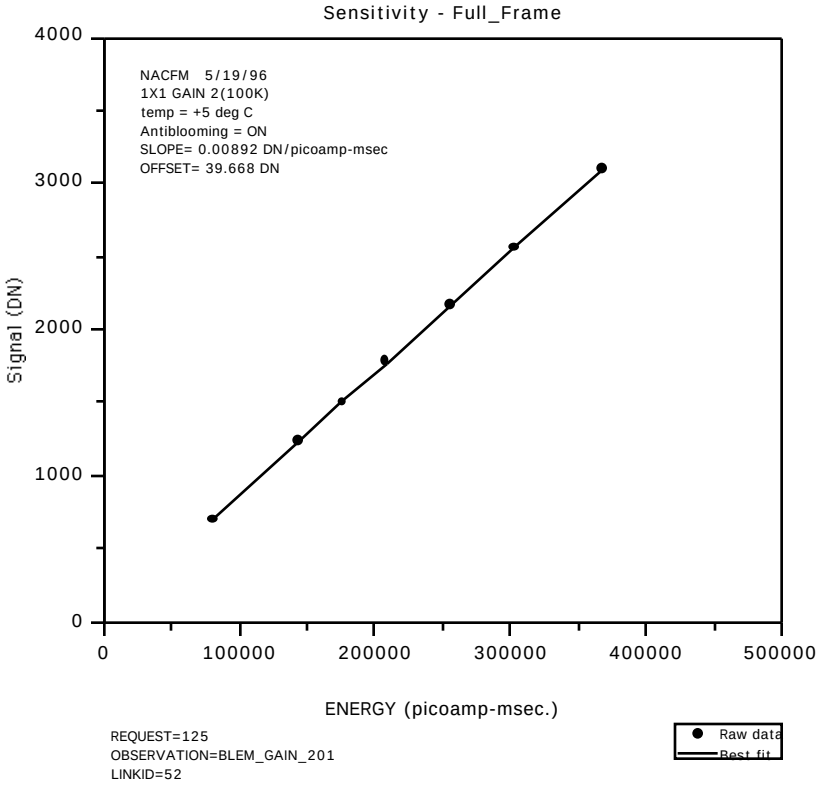

Sensitivity - Full_Frame
NACFM 7/31/96
1X1 GAIN 2(100K)
temp = +25 deg C
Antiblooming = OFF
SLOPE=0.00895 DN/picoamp-msec
OFFSET= 28.825 DN
Signal (DN)
ENERGY (picoamp -msec)
Raw data
Best fit
REQUEST=125
OBSERVATION=LTC_BLEM_GAIN_700
LINKID=45

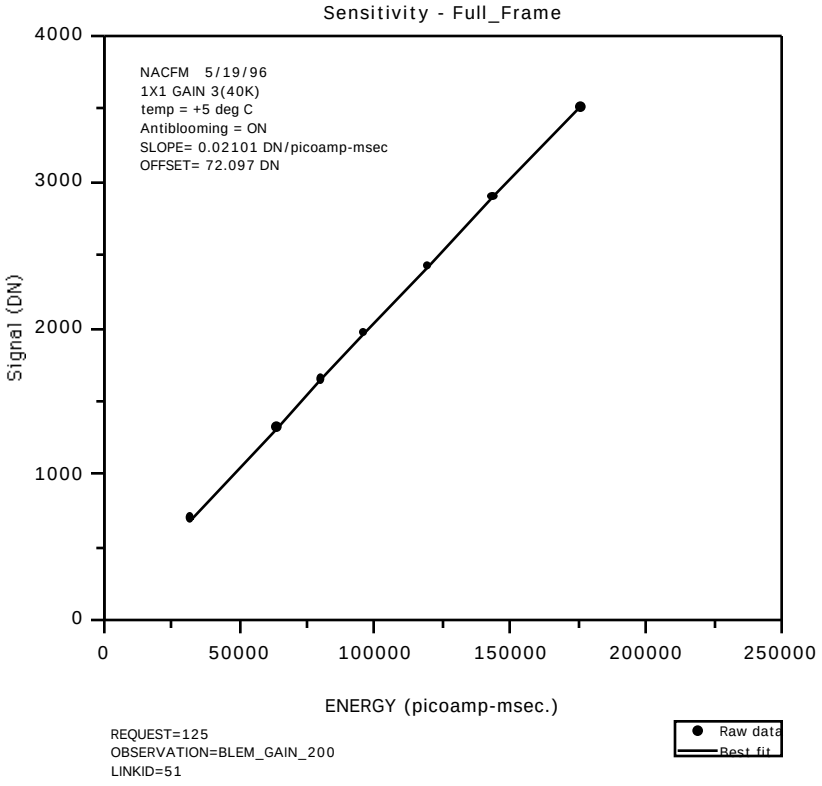

Sensitivity - Full_Frame
WACFM 7/31/96
1X1 GAIN 2(100K)
temp = +25 deg C
Antiblooming = ON
SLOPE= 0.00893 DN/picoamp-msec
OFFSET= 29.236 DN
Signal (DN)
ENERGY (picoamp-msec)
Raw data
Best fit
REQUEST=125
OBSERVATION=LTC_BLEM_GAIN_701
LINKID=46


Sensitivity - Full_Frame
NAC FM 7/31/96
1X1 GAIN 3(40K)
temp = +25 deg C
Antiblooming = OFF
SLOPE= 0.01870 DN/picoamp-msec
OFFSET= 58.979 DN
Signal (DN)
ENERGY (picoamp-msec.)
Raw data
Best fit
REQUEST=125
OBSERVATION=LTC_BLEM_GAIN_702
LINKID=47


Sensitivity - Full_Frame
NACFM 5/19/96
4X4 GAIN 0(1400K)
temp = +5 deg C
Antiblooming = ON
SLOPE= 0.0185 DN/picoamp-msec
OFFSET= 60.879 DN
Signal (DN)
ENERGY (picoamp-msec.)
Raw data
Best fit
REQUEST=125
OBSERVATION=BLEM_GAIN_203
LINKID=54 & 56


Sensitivity - Full_Frame
NACFM 5/19/96
2X2 GAIN 1(400K)
temp = +5 deg C
Antiblooming = ON
SLOPE= 0.01093 DN/picoamp-msec
OFFSET= 115.147 DN
Signal (DN)
ENERGY (picoamp-msec.)
Raw data
Best fit
REQUEST=125
OBSERVATION=BLEM_GAIN_202
LINKID=53


Sensitivity - Full_Frame
NACFM 5/19/96
1X1 GAIN 2(100K)
temp = +5 deg C
Antiblooming = ON
SLOPE= 0.00892 DN/picoamp-msec
OFFSET= 39.668 DN
Signal (DN)
4000
3000
2000
1000
0
0
100000
200000
300000
400000
500000
ENERGY (picoamp-msec.)
Raw data
Best fit
REQUEST=125
OBSERVATION=BLEM_GAIN_201
LINKID=52


Sensitivity - Full_Frame
NACFM 5/19/96
1X1 GAIN 3(40K)
temp = +5 deg C
Antiblooming = ON
SLOPE= 0.02101 DN/picoamp-msec
OFFSET= 72.097 DN
Signal (DN)
4000
3000
2000
1000
0
0
50000
100000
150000
200000
250000
ENERGY (picoamp-msec.)
Raw data
Best fit
REQUEST=125
OBSERVATION=BLEM_GAIN_200
LINKID=51

5.1.12.1.5 IMAGES USED IN SENSITIVITY ANALYSIS

Temperature =°C25

image	eventtime	observation	gain	mode	exp	rad
134582	00:52:32.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	5	800.
134583	00:54:1.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	5	800.
134584	00:55:30.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	5	800.
134585	00:57:11.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	15	800.
134586	00:58:40.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	15	800.
134587	01:0:10.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	15	800.
134588	01:1:39.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	30	800.
134589	01:3:8.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	30	800.
134591	01:6:12.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	40	800.
134592	01:7:41.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	40	800.
134622	02:15:59.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	40	800.
134594	01:10:40.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	60	800.
134595	01:12:9.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	60	800.
134596	01:13:38.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	60	800.
134597	01:15:13.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	120	800.
134598	01:16:42.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	120	800.
134599	01:18:12.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	120	800.
134600	01:19:41.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	180	800.
134601	01:21:10.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	180	800.
134602	01:22:39.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	180	800.
134603	01:24:14.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	220	800.
134604	01:25:43.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	220	800.
134605	01:27:13.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	220	800.
134609	01:33:15.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	320	800.
134611	01:36:14.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	320	800.
134624	02:44:38.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	320	800.
134612	01:37:43.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	380	800.
134613	01:39:12.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	380	800.
134614	01:40:41.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	380	800.
134615	01:42:16.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	460	800.
134616	01:43:45.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	460	800.
134618	01:46:44.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	560	800.
134619	01:48:13.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	560	800.
134620	01:49:42.0	LTC_BLEM_GAIN_700	2 (100K)	FULL	560	800.
134629	03:45:56.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	5	800.
134630	03:47:25.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	5	800.
134631	03:48:54.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	5	800.
134632	03:50:30.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	15	800.
134633	03:51:59.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	15	800.
134634	03:53:28.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	15	800.
134635	03:54:57.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	30	800.
134636	03:56:26.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	30	800.
134637	03:57:55.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	30	800.
134639	04:1:0.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	40	800.
134640	04:2:29.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	40	800.
134668	05:2:56.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	40	800.
134641	04:3:58.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	60	800.
134643	04:6:56.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	60	800.
134669	05:4:25.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	60	800.
134644	04:8:32.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	120	800.
134645	04:10:1.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	120	800.
134646	04:11:30.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	120	800.
134647	04:12:59.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	180	800.
134649	04:15:57.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	180	800.
134670	05:6:1.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	180	800.
134650	04:17:38.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	220	800.
134651	04:19:7.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	220	800.
134652	04:20:36.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	220	800.
134653	04:22:5.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	260	800.
134654	04:23:34.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	260	800.
134655	04:25:3.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	260	800.
134656	04:26:39.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	320	800.
134657	04:28:8.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	320	800.
134658	04:29:37.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	320	800.
134659	04:31:6.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	380	800.
134661	04:34:4.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	380	800.
134671	05:7:37.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	380	800.
134662	04:35:41.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	460	800.
134663	04:37:10.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	460	800.
134666	04:41:37.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	560	800.
134667	04:43:6.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	560	800.
134672	05:9:13.0	LTC_BLEM_GAIN_701	2 (100K)	FULL	560	800.
134681	05:38:54.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	5	800.
134682	05:40:23.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	5	800.
134683	05:41:52.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	5	800.
134684	05:43:28.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	15	800.
134685	05:44:57.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	15	800.
134686	05:46:26.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	15	800.
134687	05:47:55.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	20	800.
134688	05:49:24.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	20	800.
134689	05:50:53.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	20	800.
134690	05:52:29.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	25	800.
134691	05:53:58.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	25	800.
134692	05:55:27.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	25	800.
134693	05:56:56.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	30	800.
134695	05:59:54.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	30	800.
134720	06:52:17.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	30	800.
134696	06:1:30.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	60	800.
134697	06:2:59.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	60	800.
134698	06:4:28.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	60	800.
134699	06:5:57.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	90	800.
134700	06:7:26.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	90	800.
134701	06:8:55.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	90	800.
134702	06:10:31.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	100	800.
134703	06:12:0.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	100	800.
134704	06:13:29.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	100	800.
134705	06:14:58.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	120	800.

Temperature =°C25

image	eventtime	observation	gain	mode	exp	rad
134707	06:17:56.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	120	800.
134721	06:53:53.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	120	800.
134708	06:19:32.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	150	800.
134709	06:21:1.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	150	800.
134710	06:22:30.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	150	800.
134711	06:23:59.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	180	800.
134712	06:25:28.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	180	800.
134713	06:26:57.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	180	800.
134714	06:28:33.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	220	800.
134715	06:30:2.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	220	800.
134716	06:31:31.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	220	800.
134717	06:33:0.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	260	800.
134718	06:34:29.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	260	800.
134719	06:35:58.0	LTC_BLEM_GAIN_702	3 (40K)	FULL	260	800.
134728	07:19:9.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	15	800.
134729	07:20:13.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	15	800.
134730	07:21:17.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	15	800.
134731	07:22:26.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	25	800.
134732	07:23:30.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	25	800.
134733	07:24:34.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	25	800.
134734	07:25:38.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	35	800.
134735	07:26:42.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	35	800.
134736	07:27:46.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	35	800.
134737	07:28:59.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	50	800.
134738	07:30:3.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	50	800.
134739	07:31:7.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	50	800.
134740	07:32:11.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	100	800.
134741	07:33:15.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	100	800.
134742	07:34:19.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	100	800.
134743	07:35:28.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	150	800.
134744	07:36:32.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	150	800.
134745	07:37:36.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	150	800.
134746	07:38:40.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	180	800.
134747	07:39:44.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	180	800.
134748	07:40:48.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	180	800.
134749	07:42:1.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	220	800.
134750	07:43:5.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	220	800.
134751	07:44:9.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	220	800.
134752	07:45:13.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	260	800.
134753	07:46:17.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	260	800.
134754	07:47:21.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	260	800.
134755	07:48:34.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	320	800.
134756	07:49:38.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	320	800.
134757	07:50:42.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	320	800.
134758	07:51:46.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	380	800.
134759	07:52:50.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	380	800.
134760	07:53:54.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	380	800.
134761	07:55:5.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	460	800.
134762	07:56:9.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	460	800.
134763	07:57:13.0	LTC_BLEM_GAIN_703	1 (400K)	SUM2	460	800.
134774	10:34:53.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	5	800.
134775	10:35:44.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	5	800.
134776	10:36:35.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	5	800.
134778	10:38:24.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	15	800.
134779	10:39:15.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	15	800.
134791	12:9:39.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	15	800.
134780	10:40:6.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	20	800.
134781	10:40:57.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	20	800.
134782	10:41:48.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	20	800.
134783	10:42:48.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	25	800.
134784	10:43:39.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	25	800.
134785	10:44:30.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	25	800.
134786	10:45:21.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	30	800.
134787	10:46:12.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	30	800.
134788	10:47:3.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	30	800.
134792	12:10:39.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	60	800.
134793	12:11:30.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	60	800.
134794	12:12:21.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	60	800.
134795	12:13:12.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	90	800.
134796	12:14:3.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	90	800.
134797	12:14:54.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	90	800.
134798	12:15:52.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	100	800.
134799	12:16:43.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	100	800.
134800	12:17:34.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	100	800.
134801	12:18:25.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	120	800.
134802	12:19:16.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	120	800.
134803	12:20:7.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	120	800.
134804	12:21:5.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	150	800.
134805	12:21:56.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	150	800.
134806	12:22:47.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	150	800.
134807	12:23:38.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	180	800.
134808	12:24:29.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	180	800.
134809	12:25:20.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	180	800.
134810	12:26:20.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	220	800.
134811	12:27:11.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	220	800.
134812	12:28:2.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	220	800.
134813	12:28:53.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	260	800.
134814	12:29:44.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	260	800.
134815	12:30:35.0	LTC_BLEM_GAIN_704	0 (1400K)	SUM4	60	800.

Temperature =°C5

image	eventtime	observation	gain	mode	exp	rad
120328	02:4:25.0	BLEM_GAIN_200	3 (40K)	FULL	40	800.
120329	02:5:54.0	BLEM_GAIN_200	3 (40K)	FULL	40	800.

Temperature ≠C5

image	eventtime	observation	gain	mode	exp	rad
120330	02:7:23.0	BLEM_GAIN_200	3 (40K)	FULL	40	800.
120331	02:8:29.0	BLEM_GAIN_200	3 (40K)	FULL	80	800.
120333	02:11:27.0	BLEM_GAIN_200	3 (40K)	FULL	80	800.
120421	04:16:26.0	BLEM_GAIN_200	3 (40K)	FULL	80	800.
120334	02:12:56.0	BLEM_GAIN_200	3 (40K)	FULL	100	800.
120335	02:14:25.0	BLEM_GAIN_200	3 (40K)	FULL	100	800.
120336	02:15:54.0	BLEM_GAIN_200	3 (40K)	FULL	100	800.
120337	02:17:0.0	BLEM_GAIN_200	3 (40K)	FULL	120	800.
120338	02:18:29.0	BLEM_GAIN_200	3 (40K)	FULL	120	800.
120339	02:19:58.0	BLEM_GAIN_200	3 (40K)	FULL	120	800.
120340	02:21:27.0	BLEM_GAIN_200	3 (40K)	FULL	150	800.
120341	02:22:56.0	BLEM_GAIN_200	3 (40K)	FULL	150	800.
120342	02:24:25.0	BLEM_GAIN_200	3 (40K)	FULL	150	800.
120343	02:25:31.0	BLEM_GAIN_200	3 (40K)	FULL	180	800.
120344	02:27:0.0	BLEM_GAIN_200	3 (40K)	FULL	180	800.
120345	02:28:29.0	BLEM_GAIN_200	3 (40K)	FULL	180	800.
120346	02:29:58.0	BLEM_GAIN_200	3 (40K)	FULL	220	800.
120347	02:31:27.0	BLEM_GAIN_200	3 (40K)	FULL	220	800.
120348	02:32:56.0	BLEM_GAIN_200	3 (40K)	FULL	220	800.
120352	02:38:31.0	BLEM_GAIN_201	2 (100K)	FULL	100	800.
120353	02:40:0.0	BLEM_GAIN_201	2 (100K)	FULL	100	800.
120354	02:41:29.0	BLEM_GAIN_201	2 (100K)	FULL	100	800.
120355	02:42:35.0	BLEM_GAIN_201	2 (100K)	FULL	180	800.
120356	02:44:4.0	BLEM_GAIN_201	2 (100K)	FULL	180	800.
120357	02:45:33.0	BLEM_GAIN_201	2 (100K)	FULL	180	800.
120358	02:47:2.0	BLEM_GAIN_201	2 (100K)	FULL	220	800.
120359	02:48:31.0	BLEM_GAIN_201	2 (100K)	FULL	220	800.
120422	04:17:32.0	BLEM_GAIN_201	2 (100K)	FULL	220	800.
120361	02:51:19.0	BLEM_GAIN_201	2 (100K)	FULL	260	800.
120362	02:52:48.0	BLEM_GAIN_201	2 (100K)	FULL	260	800.
120423	04:18:38.0	BLEM_GAIN_201	2 (100K)	FULL	260	800.
120364	02:55:46.0	BLEM_GAIN_201	2 (100K)	FULL	320	800.
120365	02:57:15.0	BLEM_GAIN_201	2 (100K)	FULL	320	800.
120366	02:58:44.0	BLEM_GAIN_201	2 (100K)	FULL	320	800.
120367	02:59:50.0	BLEM_GAIN_201	2 (100K)	FULL	380	800.
120368	03:1:19.0	BLEM_GAIN_201	2 (100K)	FULL	380	800.
120369	03:2:48.0	BLEM_GAIN_201	2 (100K)	FULL	380	800.
120371	03:5:46.0	BLEM_GAIN_201	2 (100K)	FULL	460	800.
120372	03:7:15.0	BLEM_GAIN_201	2 (100K)	FULL	460	800.
120424	04:19:44.0	BLEM_GAIN_201	2 (100K)	FULL	460	800.
120376	03:11:35.0	BLEM_GAIN_202	1 (400K)	SUM2	80	800.
120377	03:12:39.0	BLEM_GAIN_202	1 (400K)	SUM2	80	800.

Temperature ≠C5

image	eventtime	observation	gain	mode	exp	rad
120378	03:13:43.0	BLEM_GAIN_202	1 (400K)	SUM2	80	800.
120379	03:14:48.0	BLEM_GAIN_202	1 (400K)	SUM2	150	800.
120380	03:15:52.0	BLEM_GAIN_202	1 (400K)	SUM2	150	800.
120381	03:16:56.0	BLEM_GAIN_202	1 (400K)	SUM2	150	800.
120382	03:18:0.0	BLEM_GAIN_202	1 (400K)	SUM2	180	800.
120383	03:19:4.0	BLEM_GAIN_202	1 (400K)	SUM2	180	800.
120384	03:20:8.0	BLEM_GAIN_202	1 (400K)	SUM2	180	800.
120385	03:20:49.0	BLEM_GAIN_202	1 (400K)	SUM2	220	800.
120386	03:21:53.0	BLEM_GAIN_202	1 (400K)	SUM2	220	800.
120387	03:22:57.0	BLEM_GAIN_202	1 (400K)	SUM2	220	800.
120388	03:24:1.0	BLEM_GAIN_202	1 (400K)	SUM2	260	800.
120389	03:25:5.0	BLEM_GAIN_202	1 (400K)	SUM2	260	800.
120390	03:26:9.0	BLEM_GAIN_202	1 (400K)	SUM2	260	800.
120391	03:27:14.0	BLEM_GAIN_202	1 (400K)	SUM2	320	800.
120392	03:28:18.0	BLEM_GAIN_202	1 (400K)	SUM2	320	800.
120393	03:29:22.0	BLEM_GAIN_202	1 (400K)	SUM2	320	800.
120394	03:30:26.0	BLEM_GAIN_202	1 (400K)	SUM2	380	800.
120395	03:31:30.0	BLEM_GAIN_202	1 (400K)	SUM2	380	800.
120396	03:32:34.0	BLEM_GAIN_202	1 (400K)	SUM2	380	800.
120400	03:35:50.0	BLEM_GAIN_203	0 (1400K)	SUM4	40	800.
120401	03:36:41.0	BLEM_GAIN_203	0 (1400K)	SUM4	40	800.
120402	03:37:32.0	BLEM_GAIN_203	0 (1400K)	SUM4	40	800.
120403	03:38:24.0	BLEM_GAIN_203	0 (1400K)	SUM4	80	800.
120404	03:39:15.0	BLEM_GAIN_203	0 (1400K)	SUM4	80	800.
120405	03:40:6.0	BLEM_GAIN_203	0 (1400K)	SUM4	80	800.
120406	03:40:57.0	BLEM_GAIN_203	0 (1400K)	SUM4	100	800.
120407	03:41:48.0	BLEM_GAIN_203	0 (1400K)	SUM4	100	800.
120408	03:42:39.0	BLEM_GAIN_203	0 (1400K)	SUM4	100	800.
120409	03:43:7.0	BLEM_GAIN_203	0 (1400K)	SUM4	120	800.
120410	03:43:58.0	BLEM_GAIN_203	0 (1400K)	SUM4	120	800.
120411	03:44:49.0	BLEM_GAIN_203	0 (1400K)	SUM4	120	800.
120412	03:45:40.0	BLEM_GAIN_203	0 (1400K)	SUM4	150	800.
120413	03:46:31.0	BLEM_GAIN_203	0 (1400K)	SUM4	150	800.
120414	03:47:22.0	BLEM_GAIN_203	0 (1400K)	SUM4	150	800.
120415	03:48:14.0	BLEM_GAIN_203	0 (1400K)	SUM4	180	800.
120416	03:49:5.0	BLEM_GAIN_203	0 (1400K)	SUM4	180	800.
120417	03:49:56.0	BLEM_GAIN_203	0 (1400K)	SUM4	180	800.
120418	03:50:47.0	BLEM_GAIN_203	0 (1400K)	SUM4	220	800.
120419	03:51:38.0	BLEM_GAIN_203	0 (1400K)	SUM4	220	800.
120420	03:52:29.0	BLEM_GAIN_203	0 (1400K)	SUM4	220	800.