ACIS Memo #181

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Room 37-558

To: ACIS Team
From: Beverly LaMarr (fergason@space.mit.edu)
Subject: Resolution of ACIS Devices at -110C, -120C and -123C.
Date: 10 January 2000

Documented here are the full width half max values for the rightmost quadrant of s2, i1, and s3 at -110C, -120C and -123C.

For each 128 row by 256 column bin, a gaussian was fit to each of the three main peaks at 1487 eV, 4510 eV, and 5894 eV.

The values were converted to eV from ADU using the gain for the bin closest to the framestore for each set.

Figures 1 through 3 show the resolution plots for s2. Figures 4 through 6 show the resolution plots for i1. Figures 7 through 9 show the resolution plots for s3.

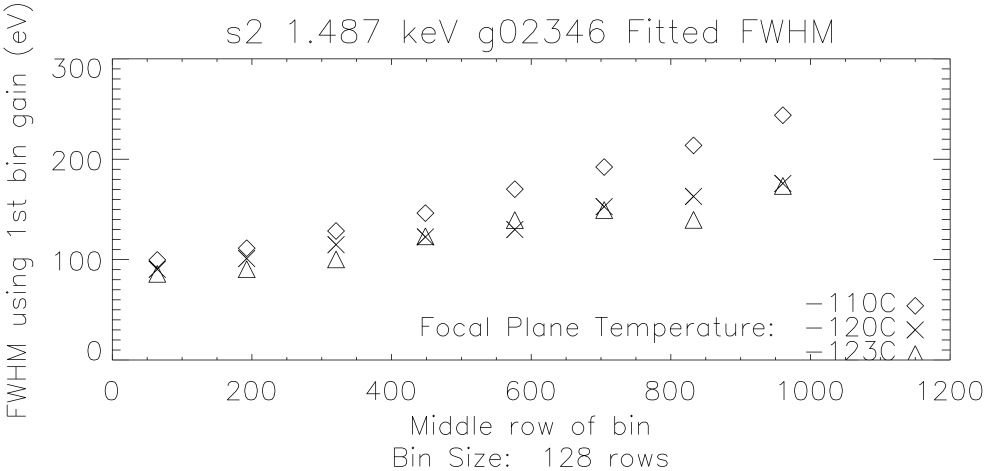

Figure 1: Front-illuminated Detector S2 Resolution Vs Row Number, 1.487keV

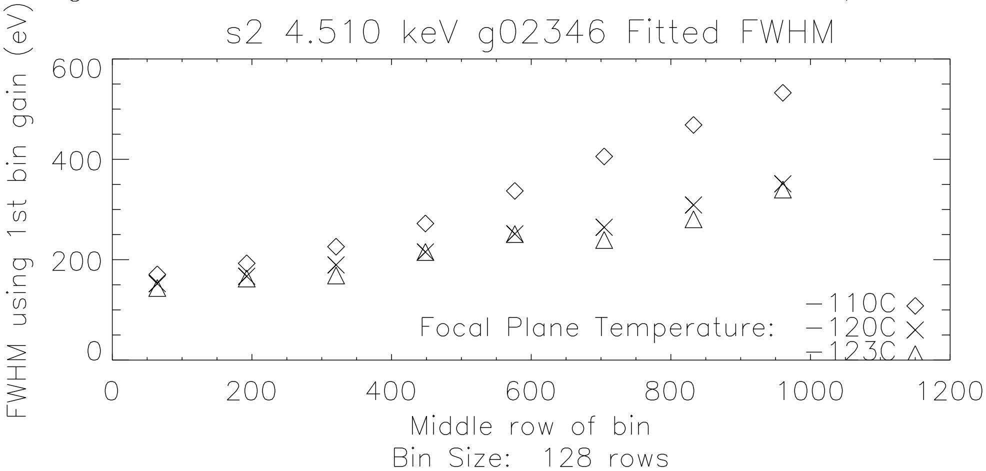

Figure 2: Front-illuminated Detector S2 Resolution Vs Row Number, 4.510keV

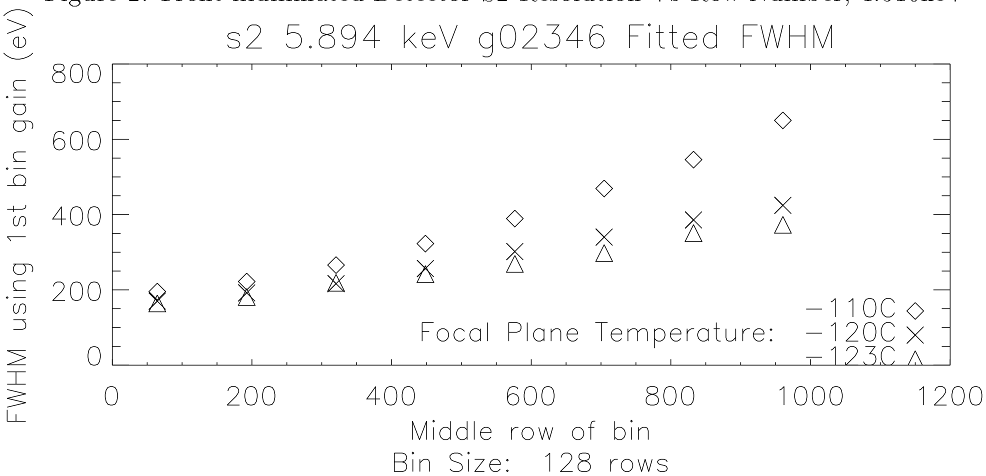

Figure 3: Front-illuminated Detector S2 Resolution Vs Row Number, 5.894keV

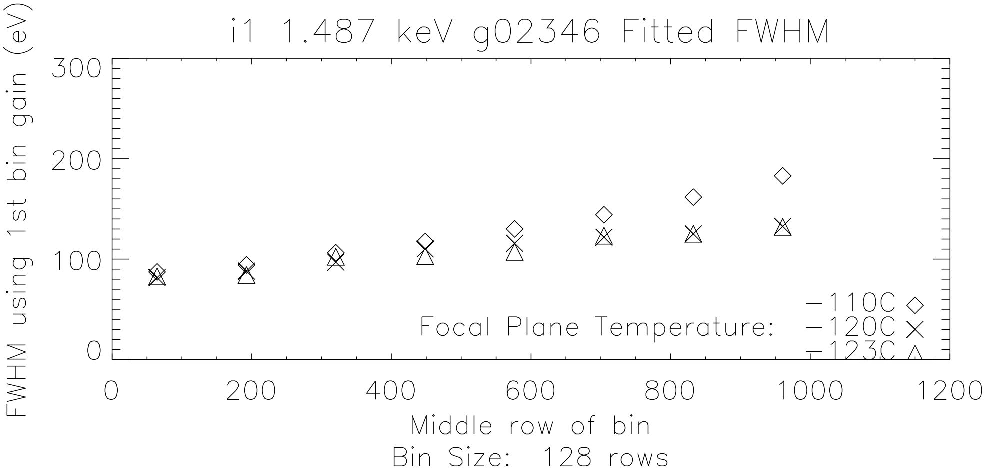

Figure 4: Front-illuminated Detector I1 Resolution Vs Row Number, 1.487keV

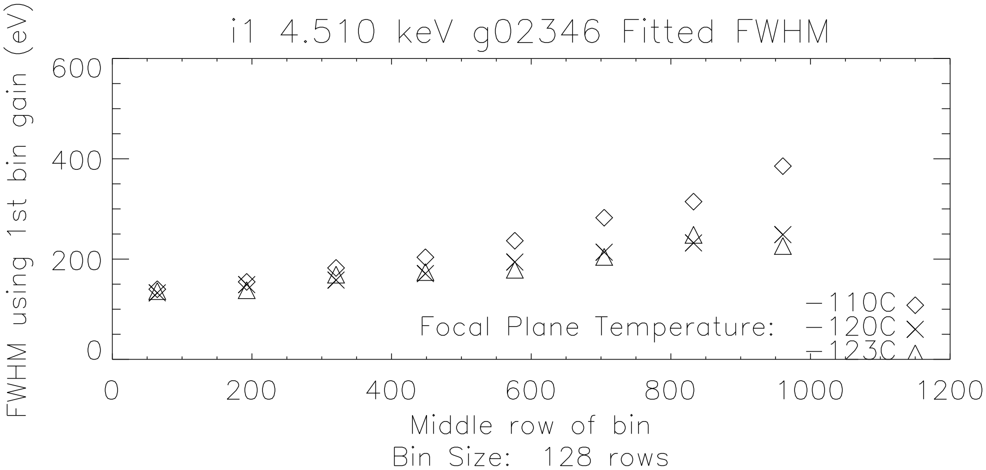

Figure 5: Front-illuminated Detector I1 Resolution Vs Row Number, 4.510keV

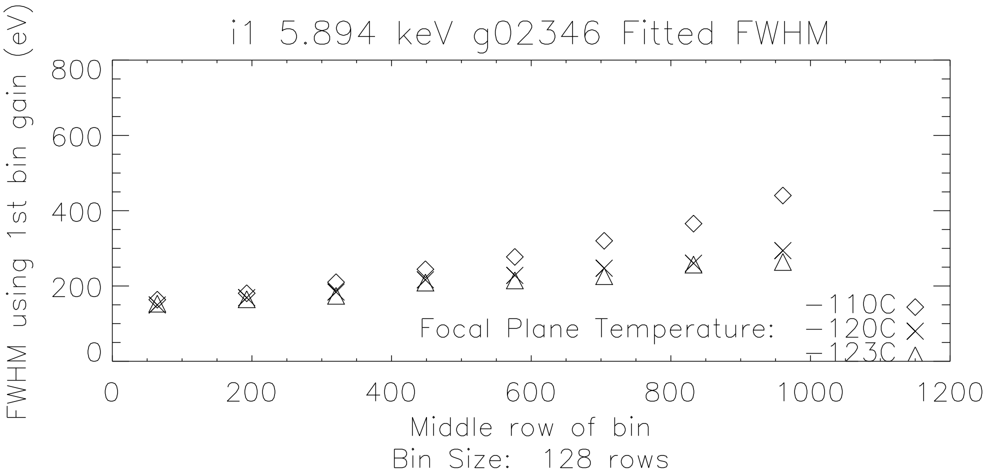

Figure 6: Front-illuminated Detector I1 Resolution Vs Row Number, 5.894keV

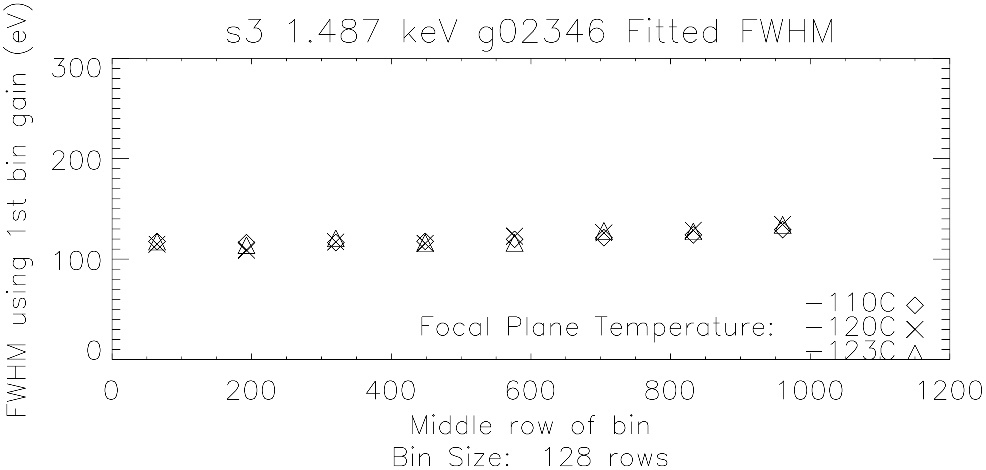

Figure 7: Back-illuminated Detector S3 Resolution Vs Row Number, 1.487keV

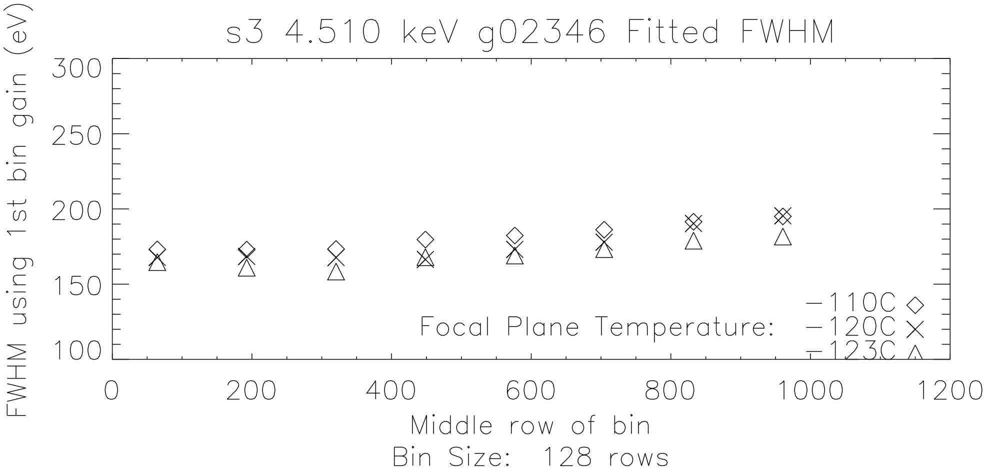

Figure 8: Back-illuminated Detector S3 Resolution Vs Row Number, 4.510keV

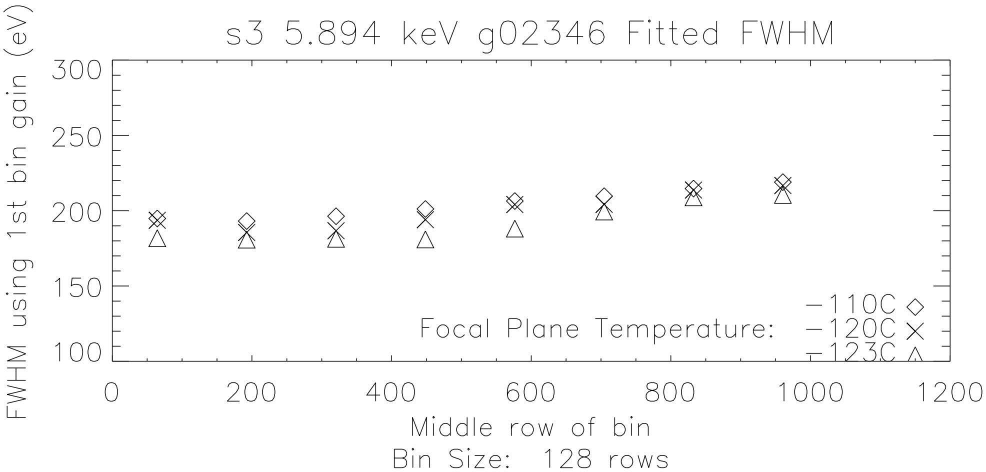

Figure 9: Back-illuminated Detector S3 Resolution Vs Row Number, 5.894keV

CCD	Line Energy eV	Middle Row of 128 row bin	FWHM at -110C eV	FWHM at -120C eV	FWHM at -123C eV
			summed evlist	obsid 62504	obsid 62248
s2	1487	64.5	99.7358	90.3171	85.9014
s2	1487	192.5	111.4022	101.0634	90.4852
s2	1487	320.5	128.5792	114.9478	100.2955
s2	1487	448.5	146.3088	122.6001	123.2590
s2	1487	576.5	170.2273	130.0327	139.4347
s2	1487	704.5	192.2941	152.8362	149.4524
s2	1487	832.5	213.8046	163.0157	139.6302
s2	1487	960.5	243.8945	175.9240	173.4724
s2	4510	64.5	170.8062	152.2899	143.8193
s2	4510	192.5	192.8318	167.0793	162.5740
s2	4510	320.5	225.9962	189.7491	168.6040
s2	4510	448.5	272.2738	215.4759	215.4707
s2	4510	576.5	337.0804	251.5773	251.1053
s2	4510	704.5	405.7798	264.7376	239.3430
s2	4510	832.5	468.5683	309.0801	280.4729
s2	4510	960.5	532.6508	351.2135	339.8164
s2	5894	64.5	195.5179	170.2000	164.2004
s2	5894	192.5	222.1302	192.0491	181.2273
s2	5894	320.5	266.0060	216.6391	219.0050
s2	5894	448.5	322.8935	256.8009	242.0815
s2	5894	576.5	389.5079	301.8373	269.2025
s2	5894	704.5	469.4089	340.2515	297.7941
s2	5894	832.5	546.1783	385.7740	350.8510
s2	5894	960.5	650.2483	424.6451	373.0104
i1	1487	64.5	87.2514	81.6058	82.8221
i1	1487	192.5	94.3378	88.0942	84.2142
i1	1487	320.5	106.3156	96.9544	102.2930
i1	1487	448.5	117.5015	110.2291	102.9880
i1	1487	576.5	130.1884	115.7901	107.2082
i1	1487	704.5	144.1914	121.7777	123.3020
i1	1487	832.5	161.7999	125.0938	125.2383
i1	1487	960.5	182.9931	132.6243	132.0936
i1	4510	64.5	139.9084	132.7393	136.2659
i1	4510	192.5	154.6300	149.1243	138.0743
i1	4510	320.5	182.3838	158.1656	169.0537
i1	4510	448.5	203.7230	171.1050	174.2000
i1	4510	576.5	236.6241	194.2710	178.7830
i1	4510	704.5	282.5285	213.7796	204.3877
i1	4510	832.5	314.7477	232.2354	248.3494
i1	4510	960.5	385.5119	248.8248	226.1153
i1	5894	64.5	163.8474	149.6531	153.2011
i1	5894	192.5	180.8002	169.1721	164.8164
i1	5894	320.5	210.1137	184.1205	173.9491
i1	5894	448.5	244.5136	216.5075	209.1746
i1	5894	576.5	277.4274	228.1398	214.8721
i1	5894	704.5	320.1933	247.3732	226.1357
i1	5894	832.5	365.7408	260.4941	256.8560
i1	5894	960.5	440.3607	294.0525	263.9072

Table 1: FWHM of Quadrant D

CCD	Line Energy eV	Middle Row of 128 row bin	FWHM at -110C eV	FWHM at -120C eV	FWHM at -123C eV
			summed evlist	obsid 62504	obsid 62248
s3	1487	64.5	117.6383	114.8789	117.4038
s3	1487	192.5	116.3474	108.9953	113.8779
s3	1487	320.5	116.4219	117.0934	120.6557
s3	1487	448.5	117.7351	115.6084	116.3019
s3	1487	576.5	119.6571	122.8714	116.2514
s3	1487	704.5	121.2774	126.1870	128.1163
s3	1487	832.5	124.1242	128.7258	127.5547
s3	1487	960.5	129.4293	134.5432	134.1808
s3	4510	64.5	173.1278	167.7597	164.6913
s3	4510	192.5	172.9745	168.4271	160.9875
s3	4510	320.5	173.4131	167.6907	158.4050
s3	4510	448.5	179.6743	166.4465	167.9667
s3	4510	576.5	182.3308	173.1053	169.0632
s3	4510	704.5	186.2422	177.9279	173.3368
s3	4510	832.5	191.4781	190.3430	178.9346
s3	4510	960.5	195.0333	195.4762	181.6542
s3	5894	64.5	194.8495	193.6593	181.7555
s3	5894	192.5	193.1277	185.5508	180.7926
s3	5894	320.5	196.3666	186.7272	181.3716
s3	5894	448.5	201.1812	194.0440	180.9534
s3	5894	576.5	206.4351	204.1206	188.1411
s3	5894	704.5	209.6431	204.2192	199.4916
s3	5894	832.5	214.7082	213.7034	208.9066
s3	5894	960.5	218.9823	216.7174	210.4421

Table 2: FWHM of Quadrant D