

V&V Reference Report

L2 ASCDS Version : 10.6

Observation 21038 - L2 Version 1
Chandra X-Ray Center

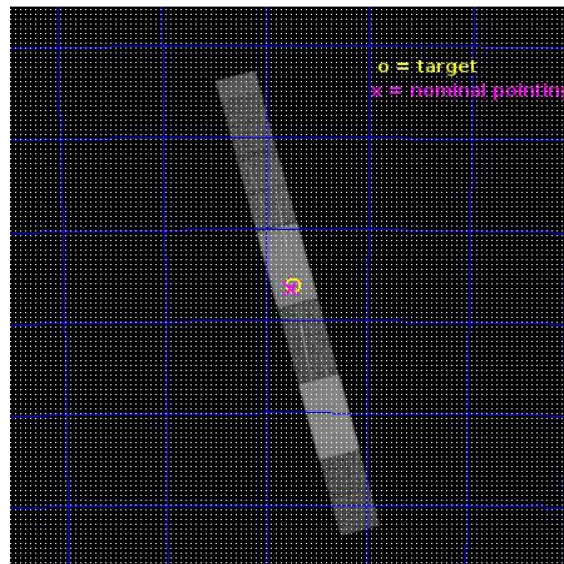
L2 Processing Date : Mar 19 2018

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1 Front

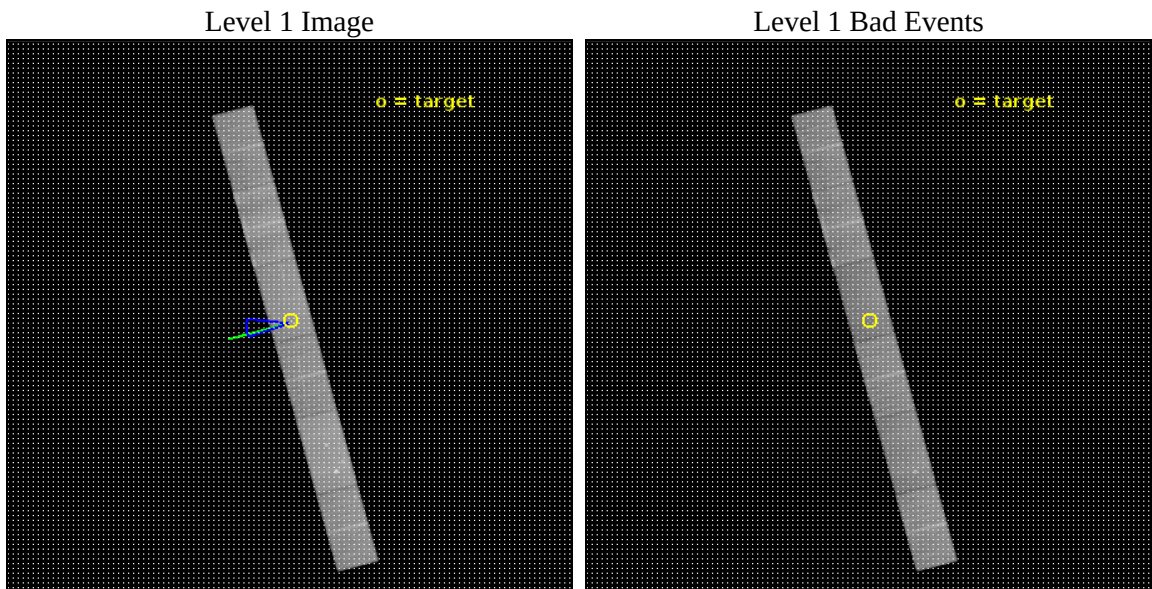
seq_num	503016	Sequence number
obs_id	21038	Observation id
title	High Resolution Spectroscopy of SN 1987A	Proposal title
observer	SANGWOOK PARK	Principal investigator
object	SN 1987A	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	83.866667	Observer's specified target RA [deg]
dec_targ	-69.26975	Observer's specified target Dec [deg]
ra_nom	83.875901113666	Nominal RA [deg]
dec_nom	-69.274788830048	Nominal Dec [deg]
roll_nom	255.16524150591	Nominal Roll [deg]
revision	1	Processing version of data
ontime	35043.800982952	Sum of GTIs [s]
livetime	34217.744377509	Livetime [s]
ontime4	35043.800982952	Sum of GTIs [s]
ontime5	35043.800982952	Sum of GTIs [s]
ontime6	35043.800982952	Sum of GTIs [s]
ontime7	35043.800982952	Sum of GTIs [s]
ontime8	35043.800982952	Sum of GTIs [s]
ontime9	35042.059962749	Sum of GTIs [s]
l2events	237263	Number of level 2 events



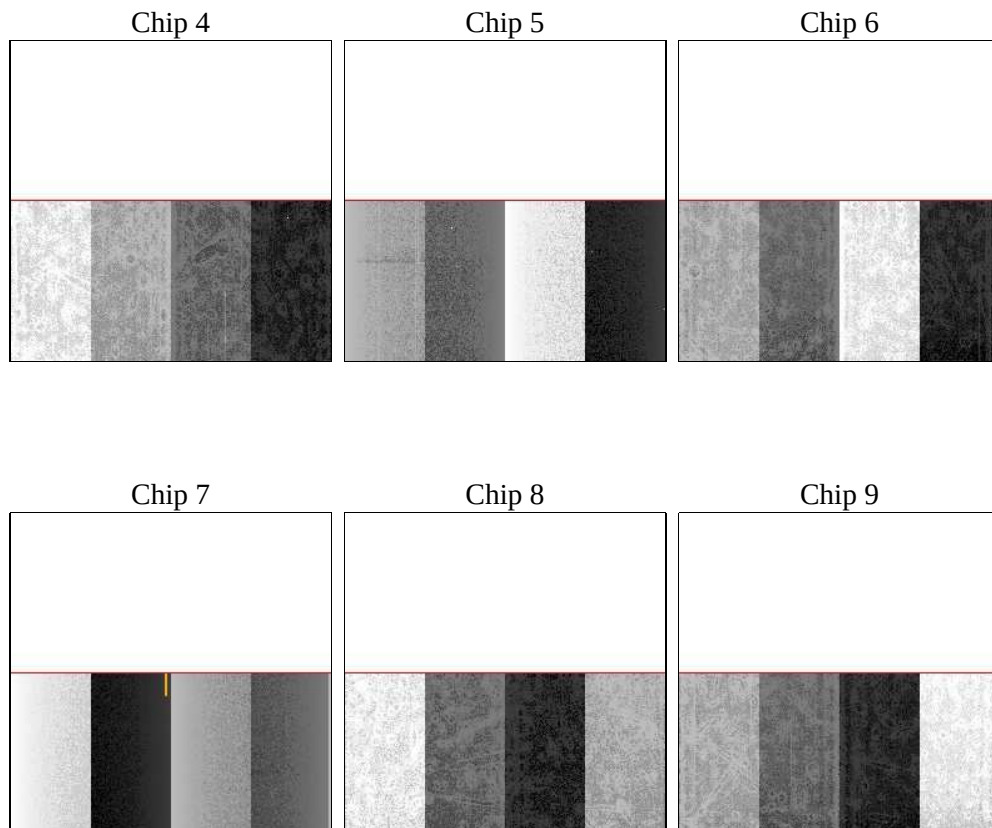
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	35000.000000	[s] Scheduled observation exposure time
ascdsver	10.6	Processing system revision	ontime	35043.800982952	Sum of GTIs [s]
caldsver	4.7.8	 	ontime4	35043.800982952	Sum of GTIs [s]
date	2018-03-19T21:27:25	Date and time of file creation	ontime5	35043.800982952	Sum of GTIs [s]
revision	1	Processing version of data	ontime6	35043.800982952	Sum of GTIs [s]
			ontime7	35043.800982952	Sum of GTIs [s]
			ontime8	35043.800982952	Sum of GTIs [s]
			ontime9	35042.059962749	Sum of GTIs [s]
			l1events	1013311	Number of level 1 events
			tgmethod	TGDETECT	Method used to create src1a file
			src1a_pos	(4120.84, 4121.00)	src1a sky pixel position

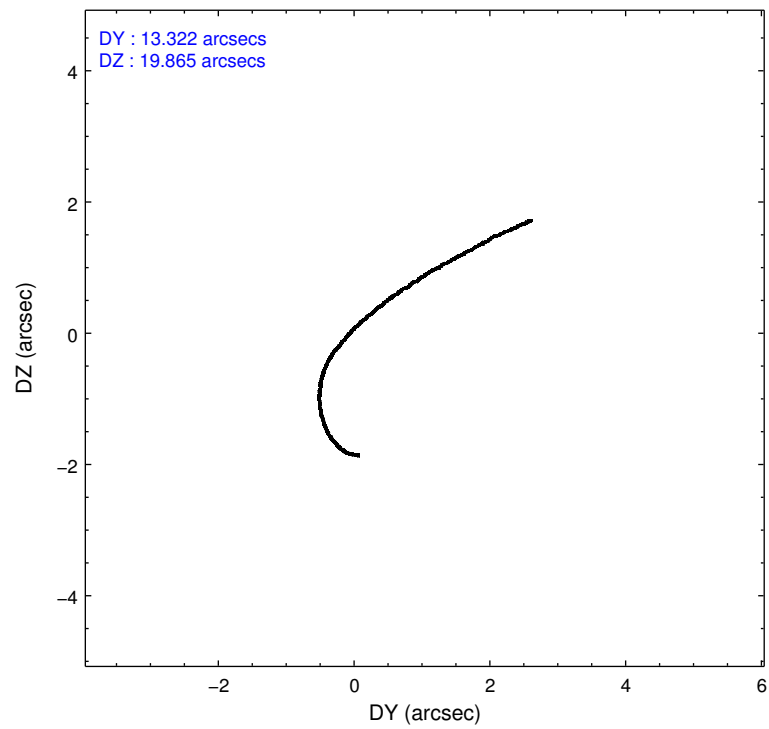
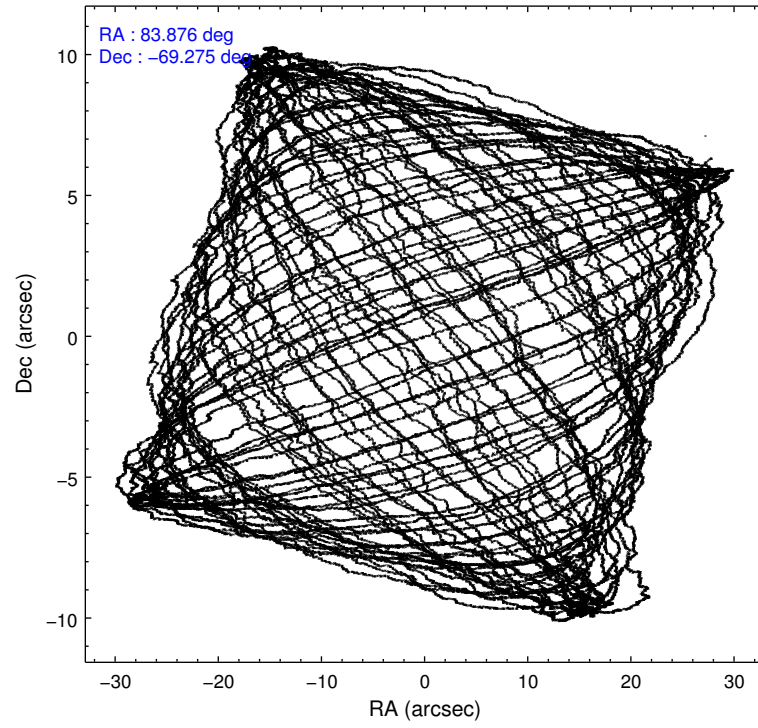
2.1.4 Events

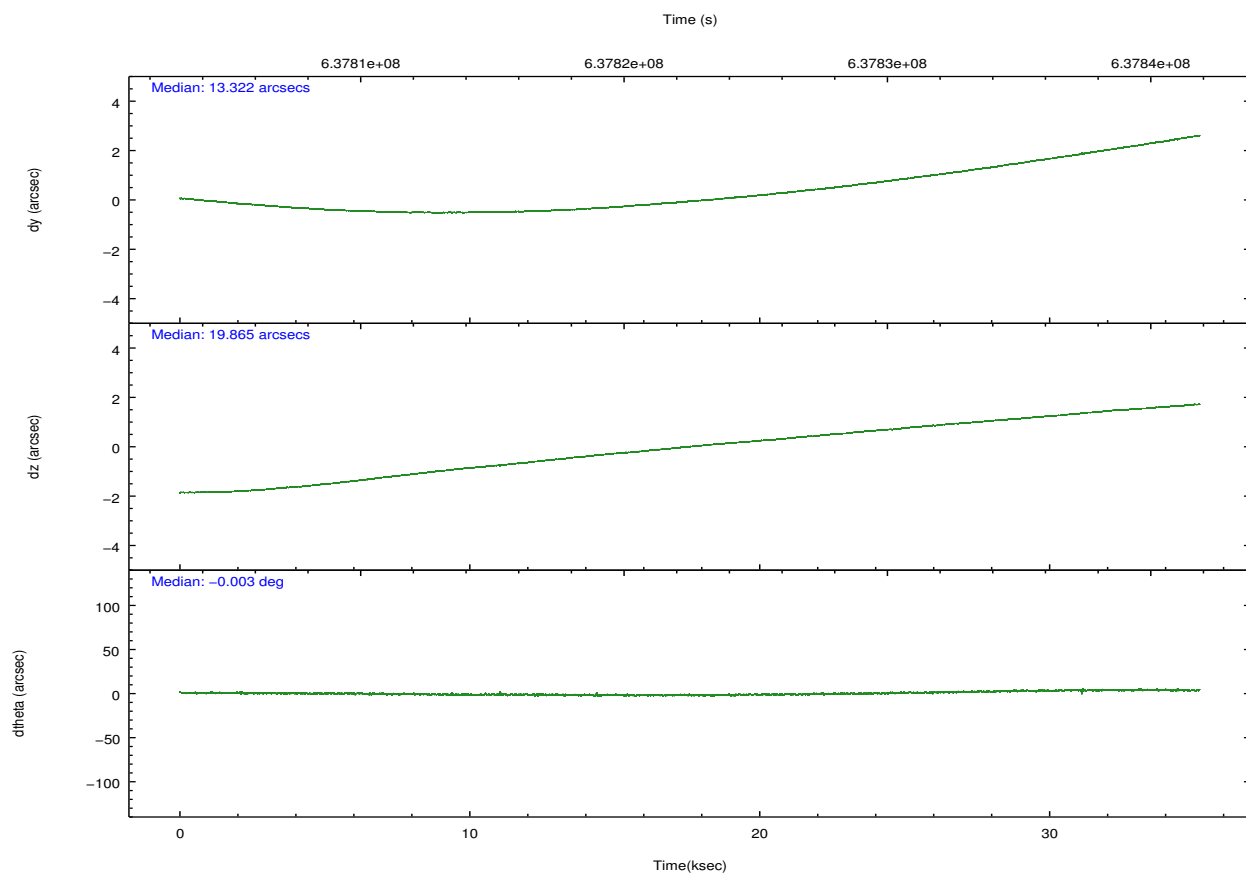
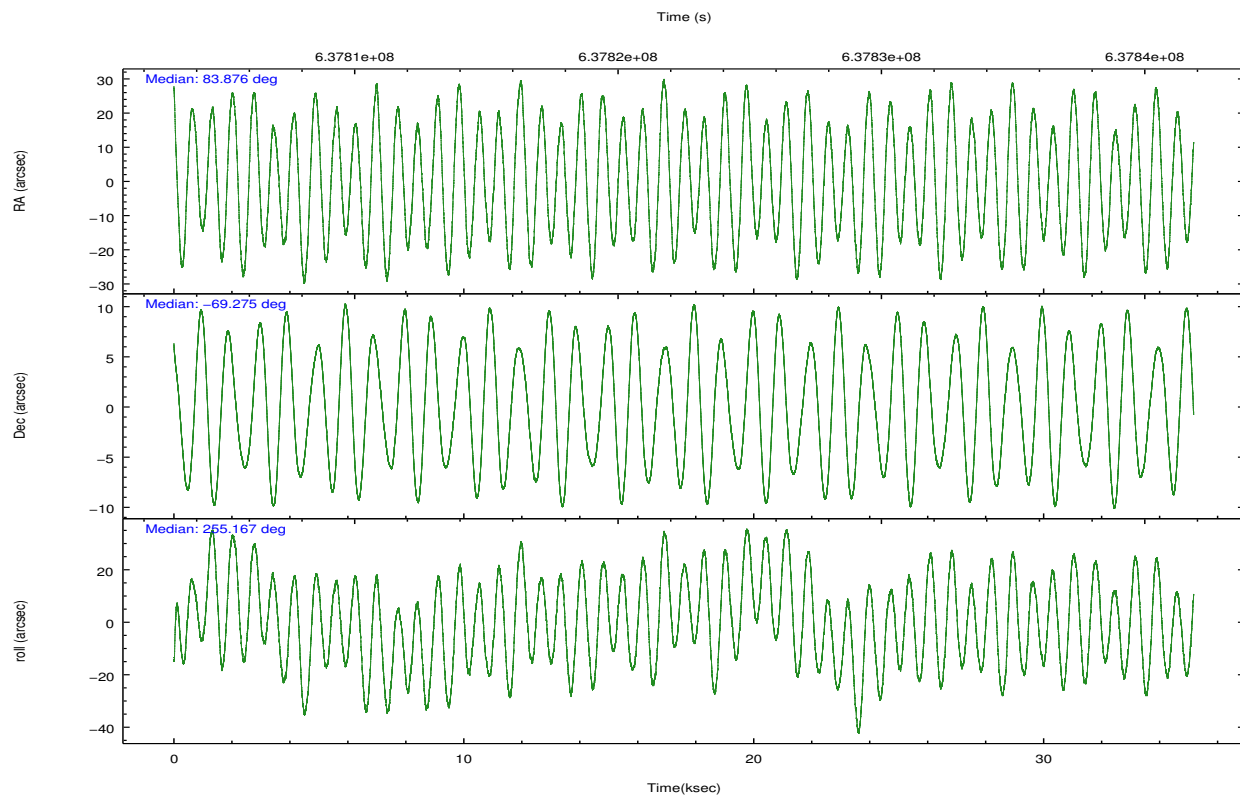
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9		ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	159393	215458	145268	174153	184296	134743	grade 0 events	6635	12328	7492	8149	14924	5821
rejected events	141629	108873	126494	92659	133493	117767		4%	5%	5%	4%	8%	4%
rejected %	88%	50%	87%	53%	72%	87%	grade 1 events	84	1989	59	229	116	71
								0%	0%	0%	0%	0%	0%
							grade 2 events	4213	30600	3951	17099	11577	3725
								2%	14%	2%	9%	6%	2%
							grade 3 events	1934	4954	1894	7663	5352	1973
								1%	2%	1%	4%	2%	1%
							grade 4 events	1917	4649	1875	7596	5055	1960
								1%	2%	1%	4%	2%	1%
							grade 5 events	5852	14777	5770	16767	8839	6506
								3%	6%	3%	9%	4%	4%
							grade 6 events	3066	54065	3562	40990	13897	3499
								1%	25%	2%	23%	7%	2%
							grade 7 events	135692	92096	120665	75660	124536	111188
								85%	42%	83%	43%	67%	82%

2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-456789	ACIS-456789	Obspar file type	PREDICTED	ACTUAL
Grating	HETG	HETG	Obspar update status	NONE	UPDATED
Data mode	FAINT	FAINT	CCD I0 on	N	N
Observation mode	POINTING	POINTING	CCD I1 on	N	N
[deg] Pointing RA	83.854673	83.87590111366617	CCD I2 on	N	N
[deg] Pointing Dec	-69.248412	-69.27478883004825	CCD I3 on	N	N
[deg] Pointing Roll	254.988784	255.1652415059143	CCD S0 on	O1	Y
[deg] Roll angle	264.000000	264.000000	CCD S1 on	Y	Y
[deg] Roll tolerance	12.000000	12.000000	CCD S2 on	Y	Y
Roll constraint allows 180D rotation	N	N	CCD S3 on	Y	Y
[s] Window start time (MET)	636940869.184000	636940869.184000	CCD S4 on	Y	Y
[s] Window stop time (MET)	639014469.184000	639014469.184000	CCD S5 on	Y	Y
[mm] SIM focus pos	-0.684267	-0.6828225247311905	Number of optional ACIS chips dropped	0	0
[mm] SIM defocus	0	0.001444936568705701	On-chip summing requested	N	N
[mm] SIM translation stage pos	-183.992523	-183.9875365069546	Subarray requested	CUSTOM	1/2
[mm] SIM translation stage offset	-6.14	-6.144986076053243	Subarray start row	1	1
[s] Observation start time (MET)	637805099.184000	637804096.46885	Subarray row count	512	512
Observation start date	2018-03-19T00:03:50	2018-03-18T23:48:16	Alternating exposures requested	N	N
[s] Observation end time (MET)	637840099.184000	637840859.63351	[s] Primary exposure time	0.000000	1.7
Observation end date	2018-03-19T09:47:10	2018-03-19T10:00:59			
Read mode	TIMED	TIMED			

2.3 Aspect



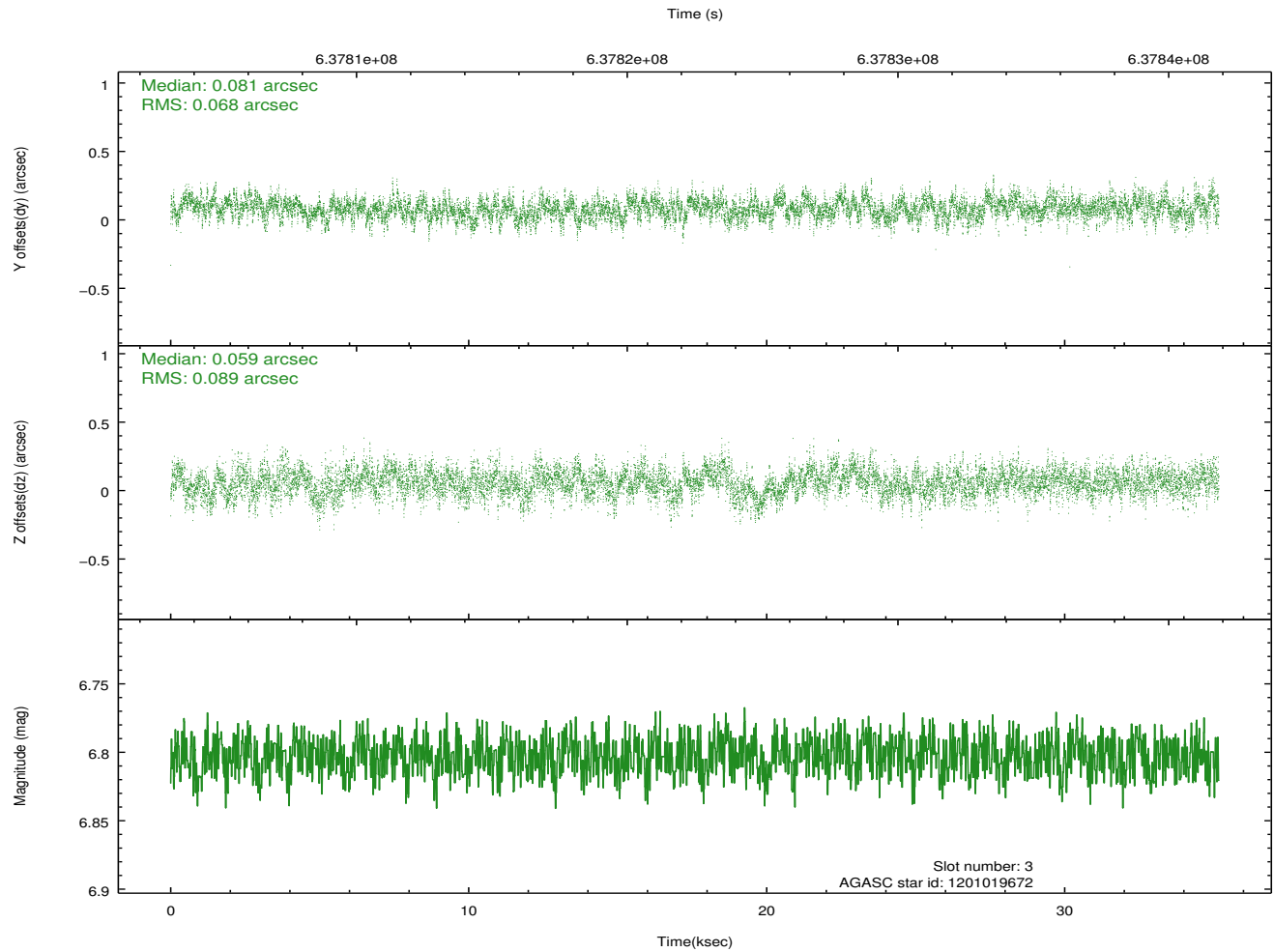
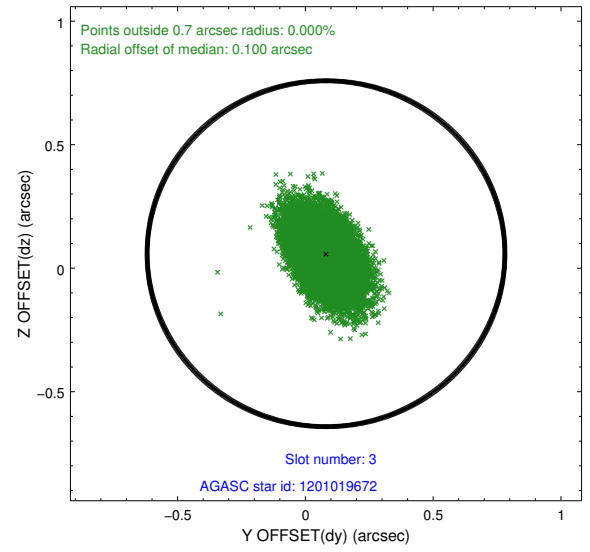
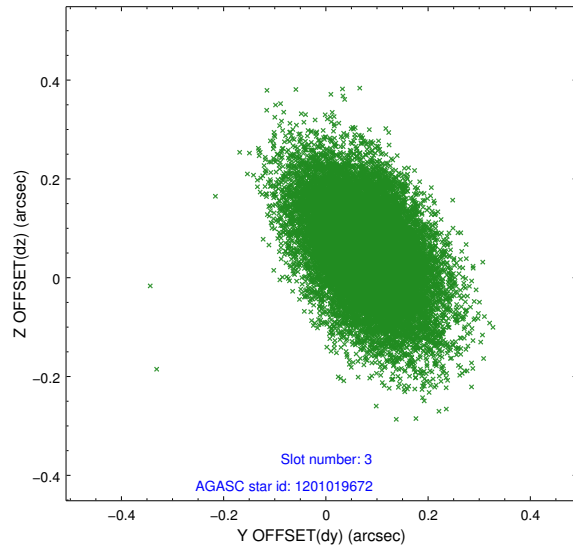


Slot Statistics

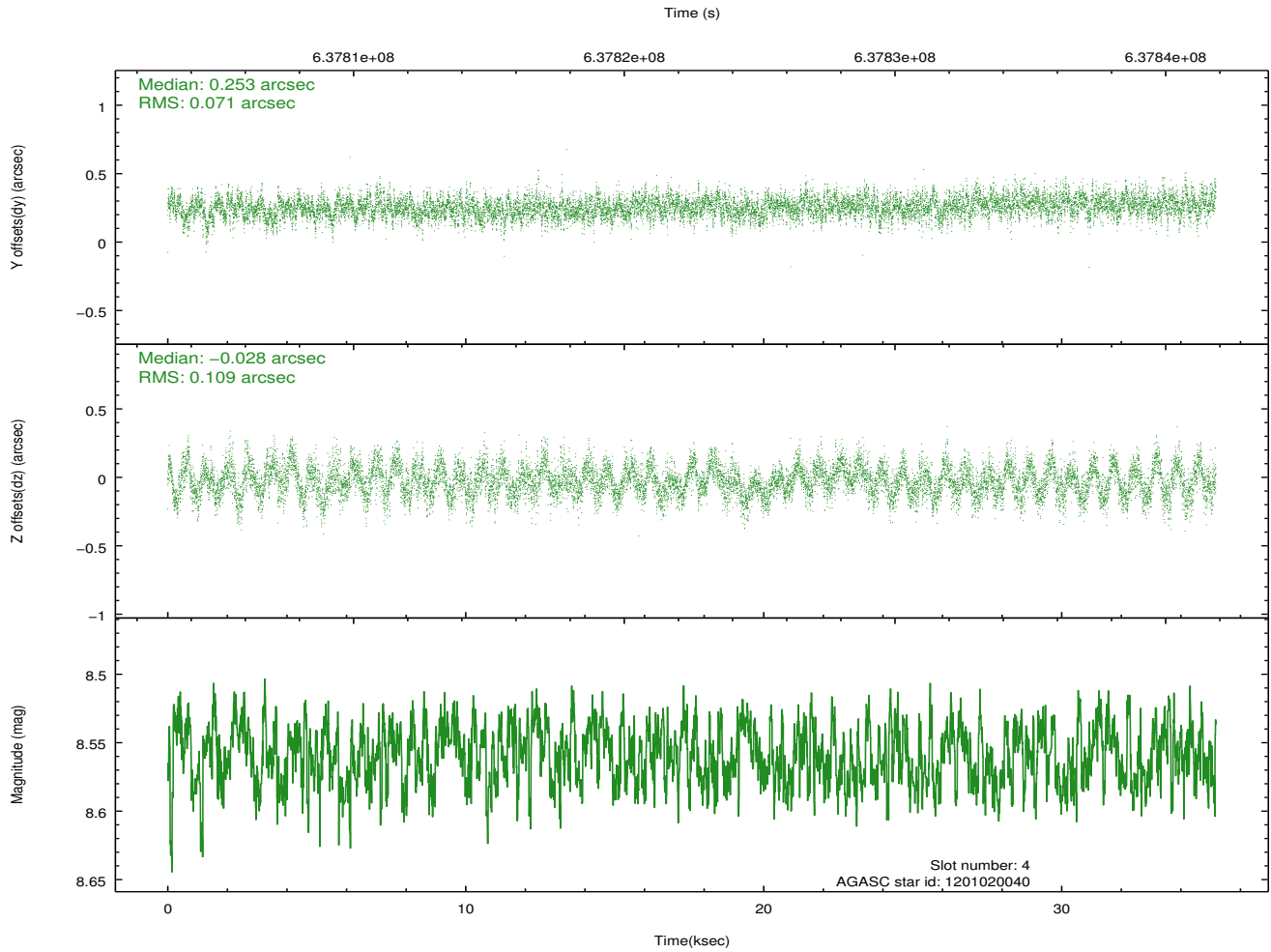
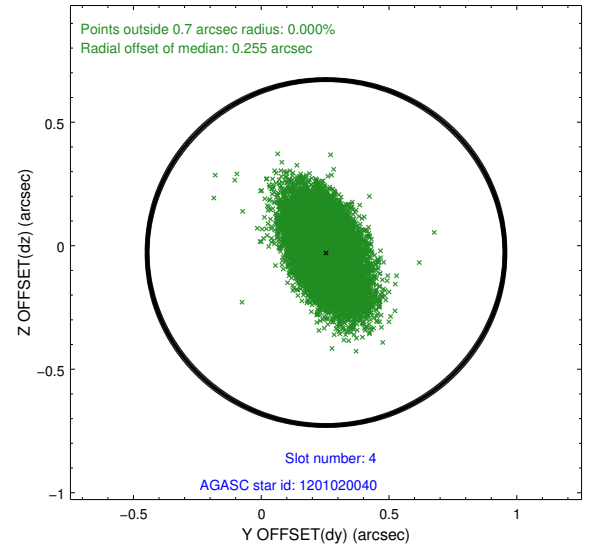
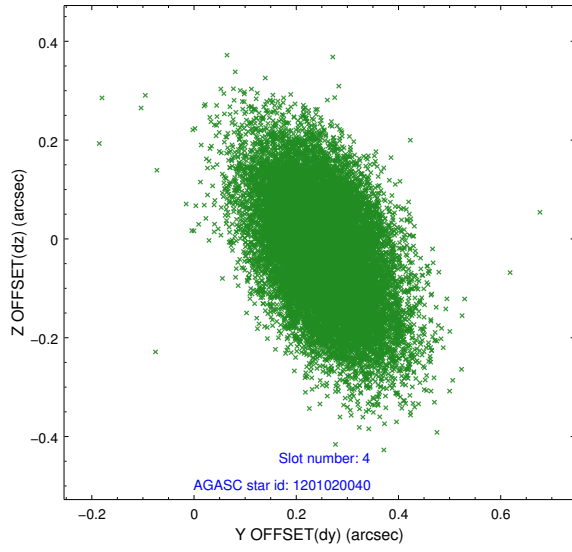
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-S-1	7.22	8578	0.112	0.123	0.036	0.055	0.000000	0.000000	929.84	-1863.52
1	FID		ACIS-S-2	7.12	8579	-0.385	-0.231	0.030	0.038	0.000000	0.000000	-766.55	-1868.39
2	FID		ACIS-S-4	7.20	8579	0.246	0.112	0.028	0.048	0.000000	0.000000	2147.29	40.51
3	GUIDE	used	1201019672	6.80	17156	0.081	0.059	0.116	0.201	85.312192	-68.770187	-2132.99	1395.39
4	GUIDE	used	1201020040	8.56	17155	0.253	-0.028	0.135	0.233	85.379163	-68.879396	-1771.34	1572.58
5	GUIDE	used	1201540776	9.54	17127	-0.188	-0.204	0.197	0.333	85.107945	-69.858480	1734.19	2073.56
6	GUIDE	used	1201542672	8.17	17144	-0.123	-0.159	0.114	0.193	84.492488	-69.957531	2262.74	1422.69
7	GUIDE	used	1201410616	9.28	17119	-0.018	0.333	0.205	0.345	82.516808	-69.784406	2312.46	-1102.40

2.4 Star Slots

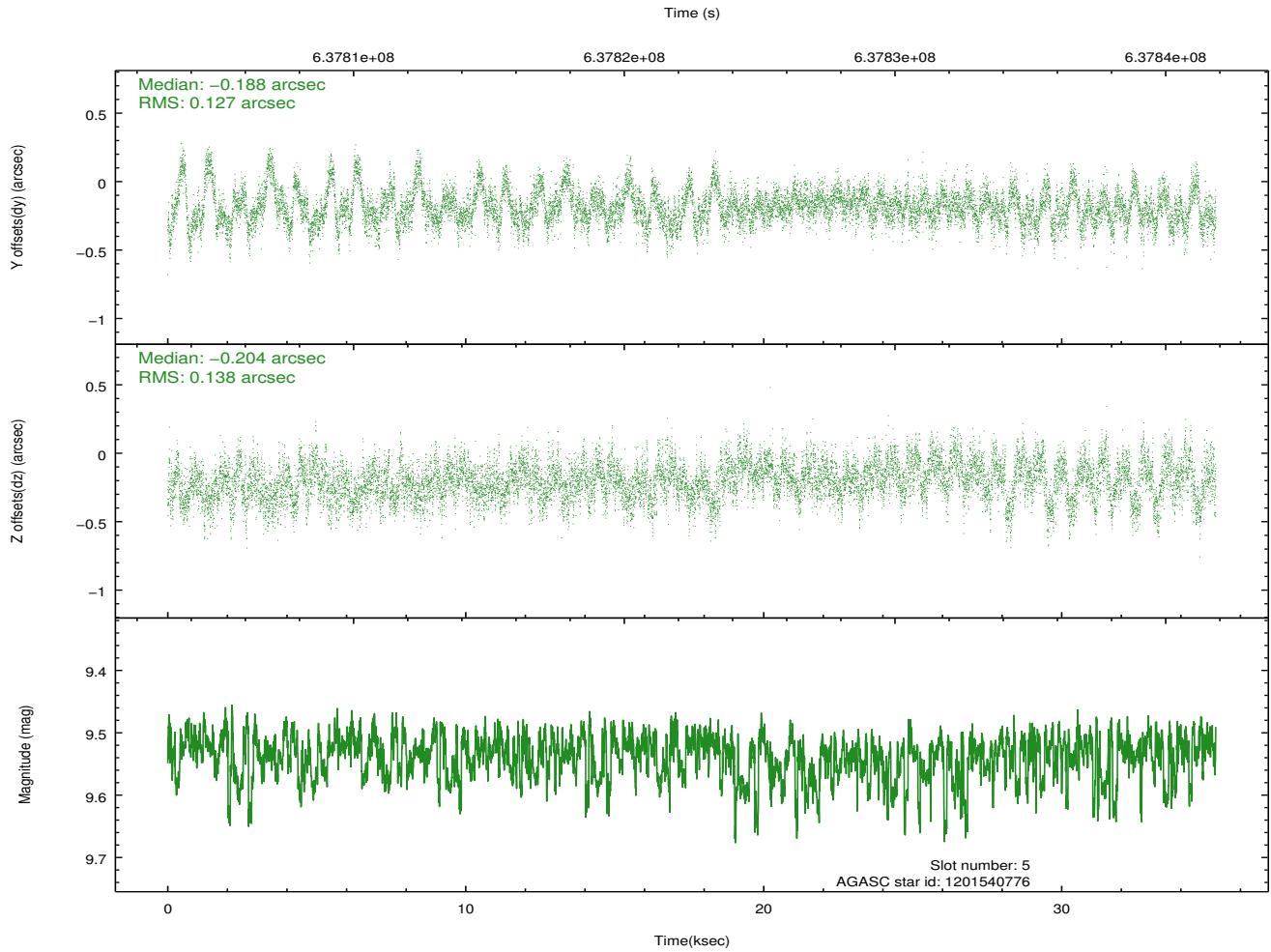
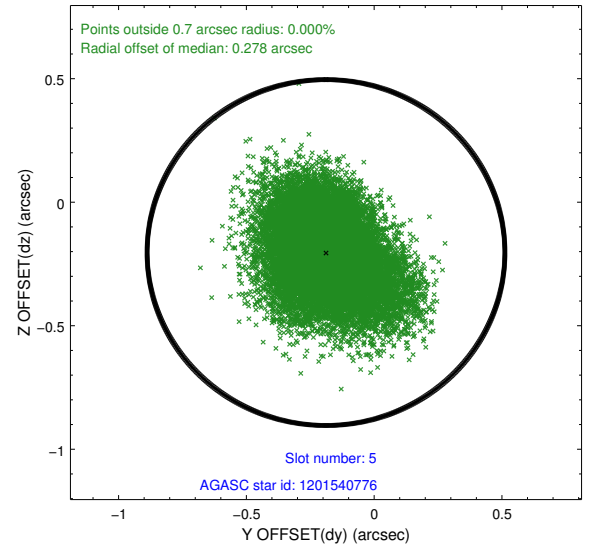
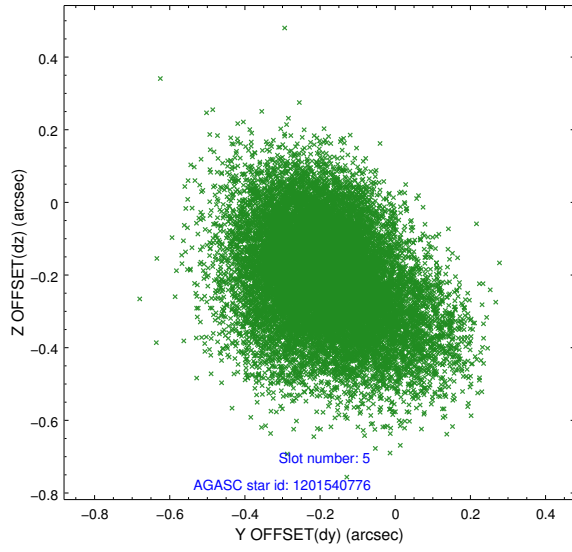
2.4.1 Slot 3



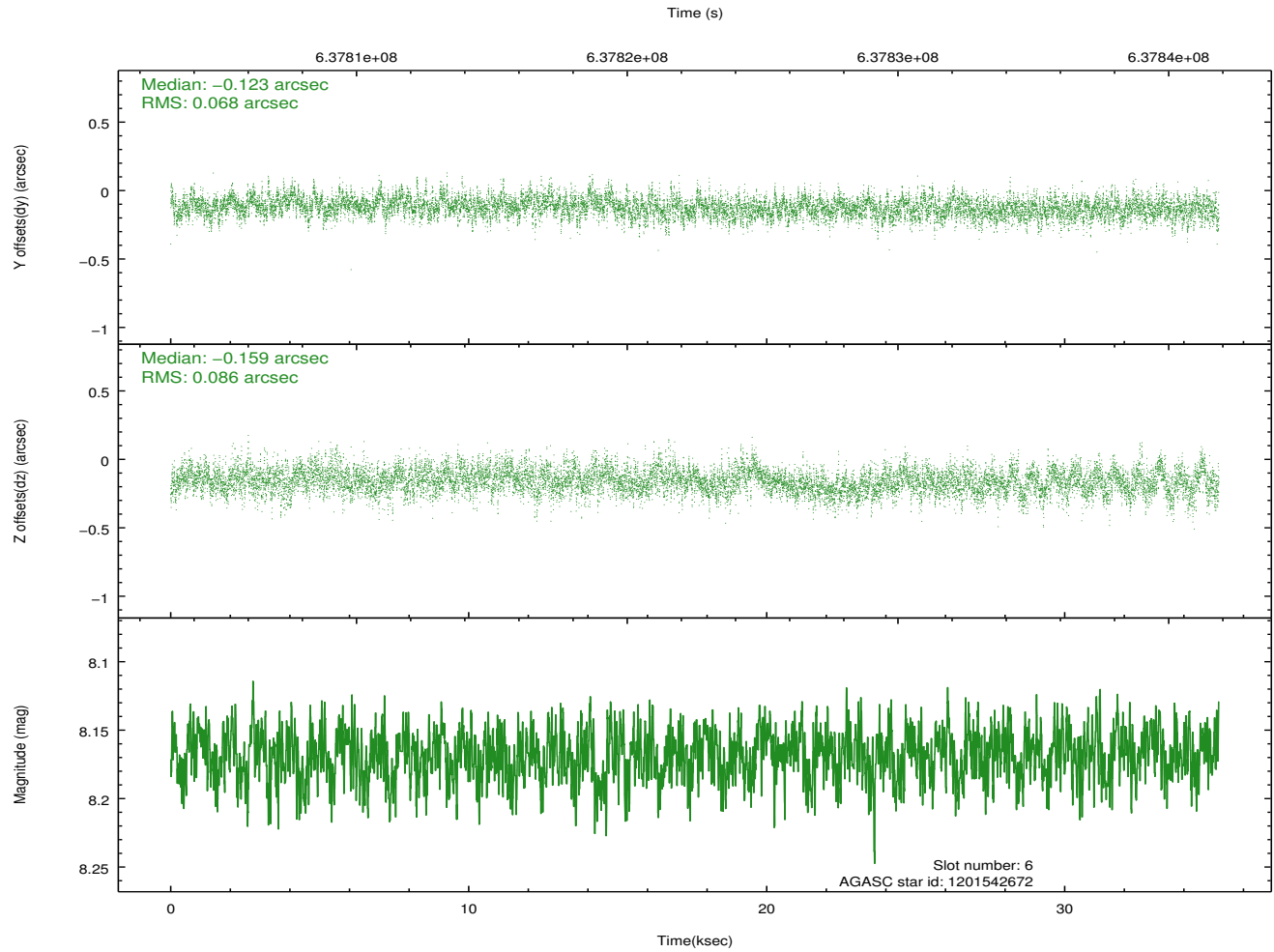
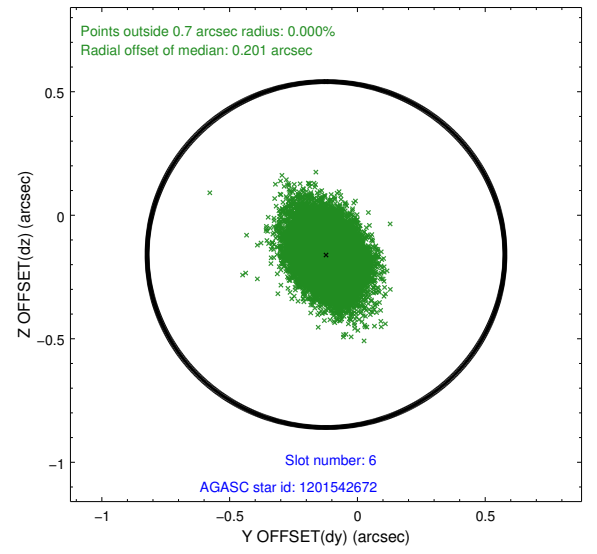
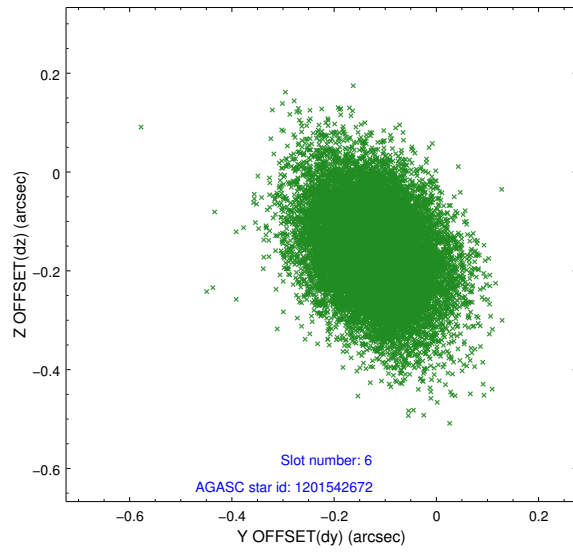
2.4.2 Slot 4



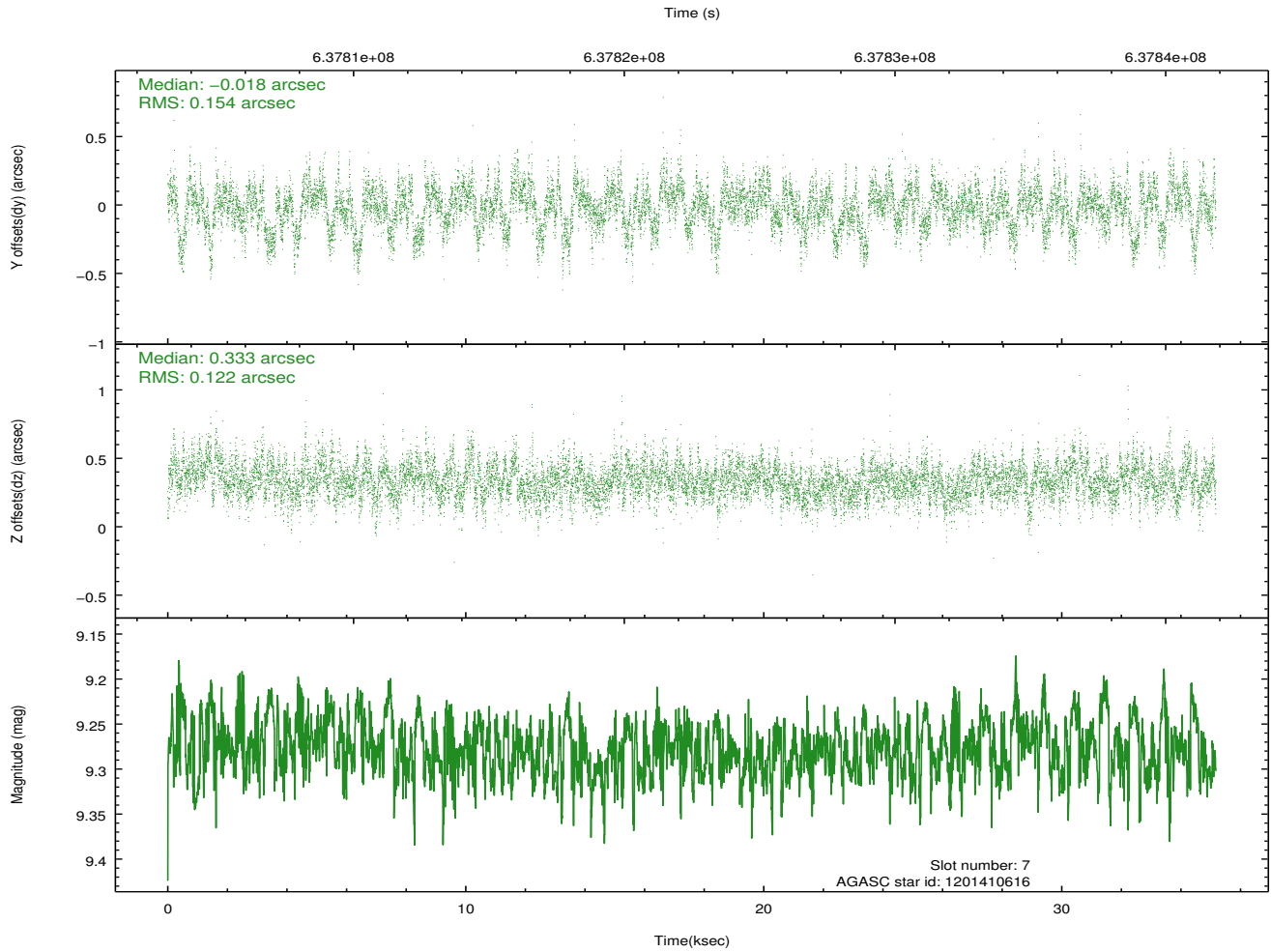
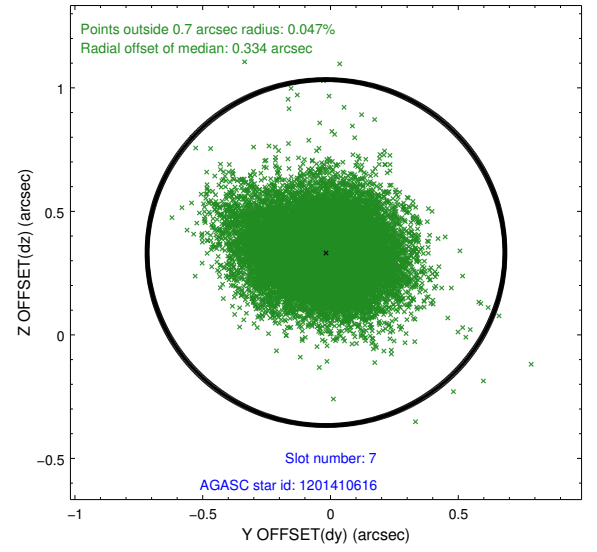
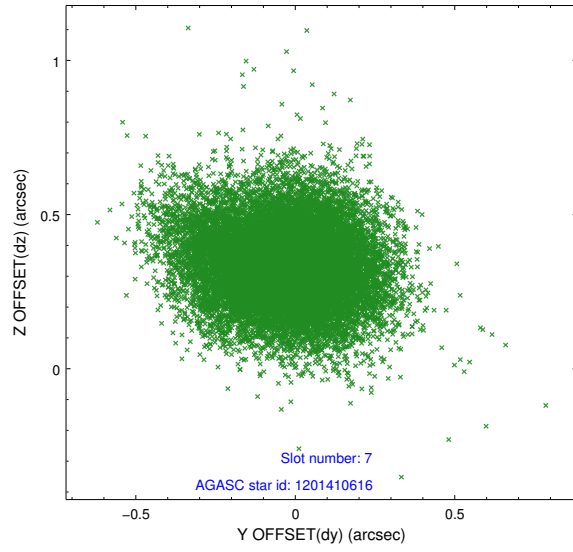
2.4.3 Slot 5



2.4.4 Slot 6

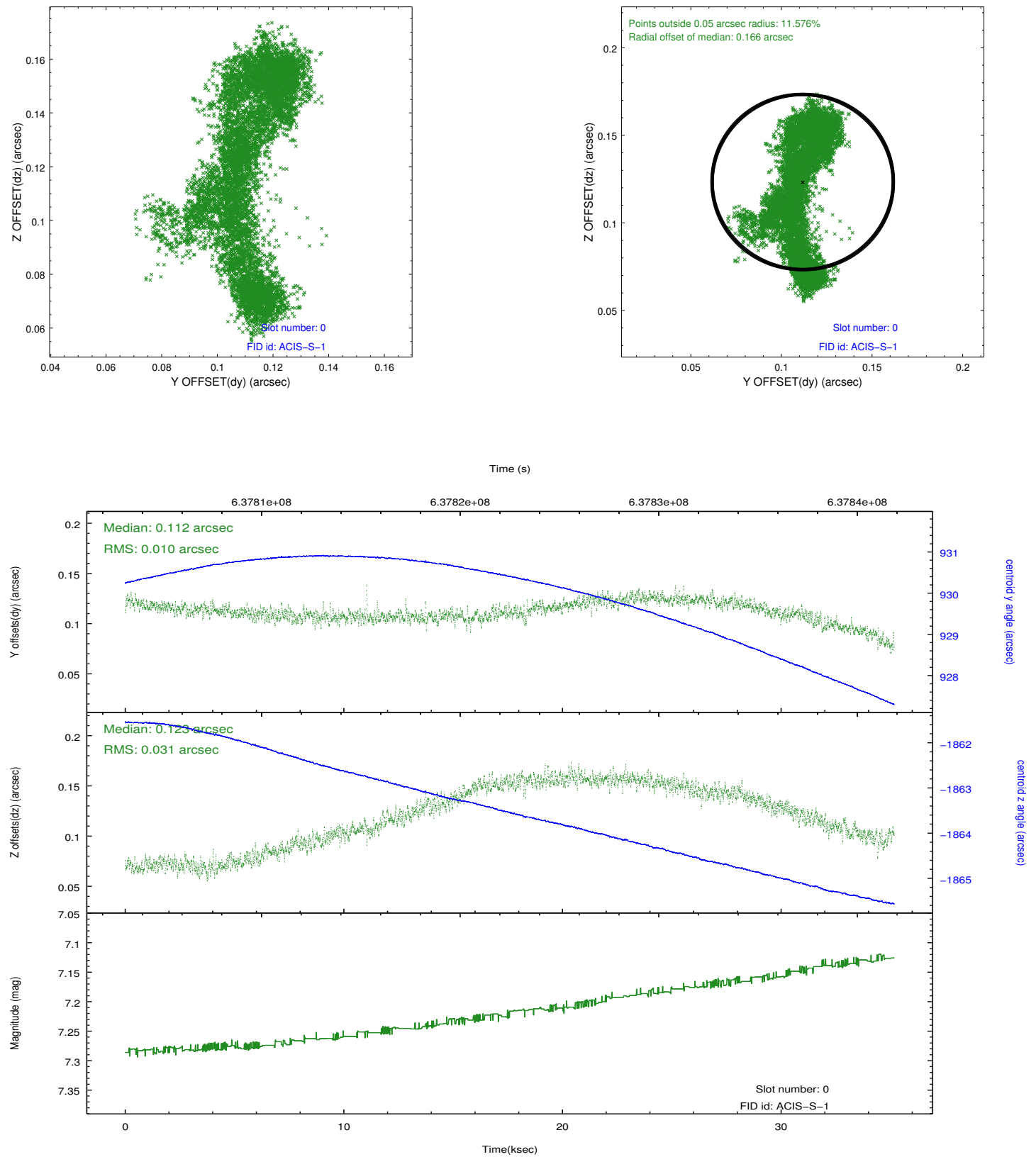


2.4.5 Slot 7

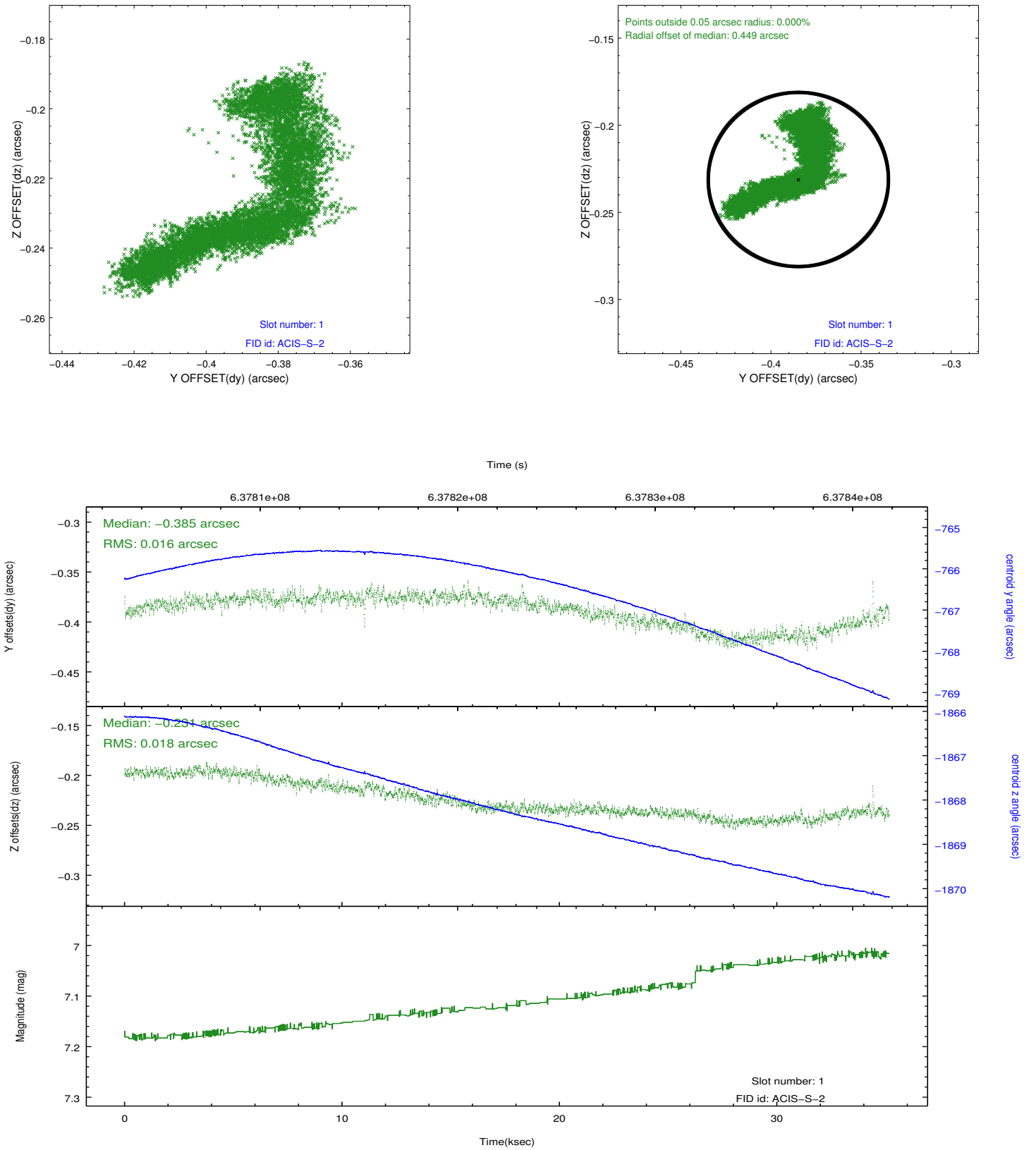


2.5 FID Slots

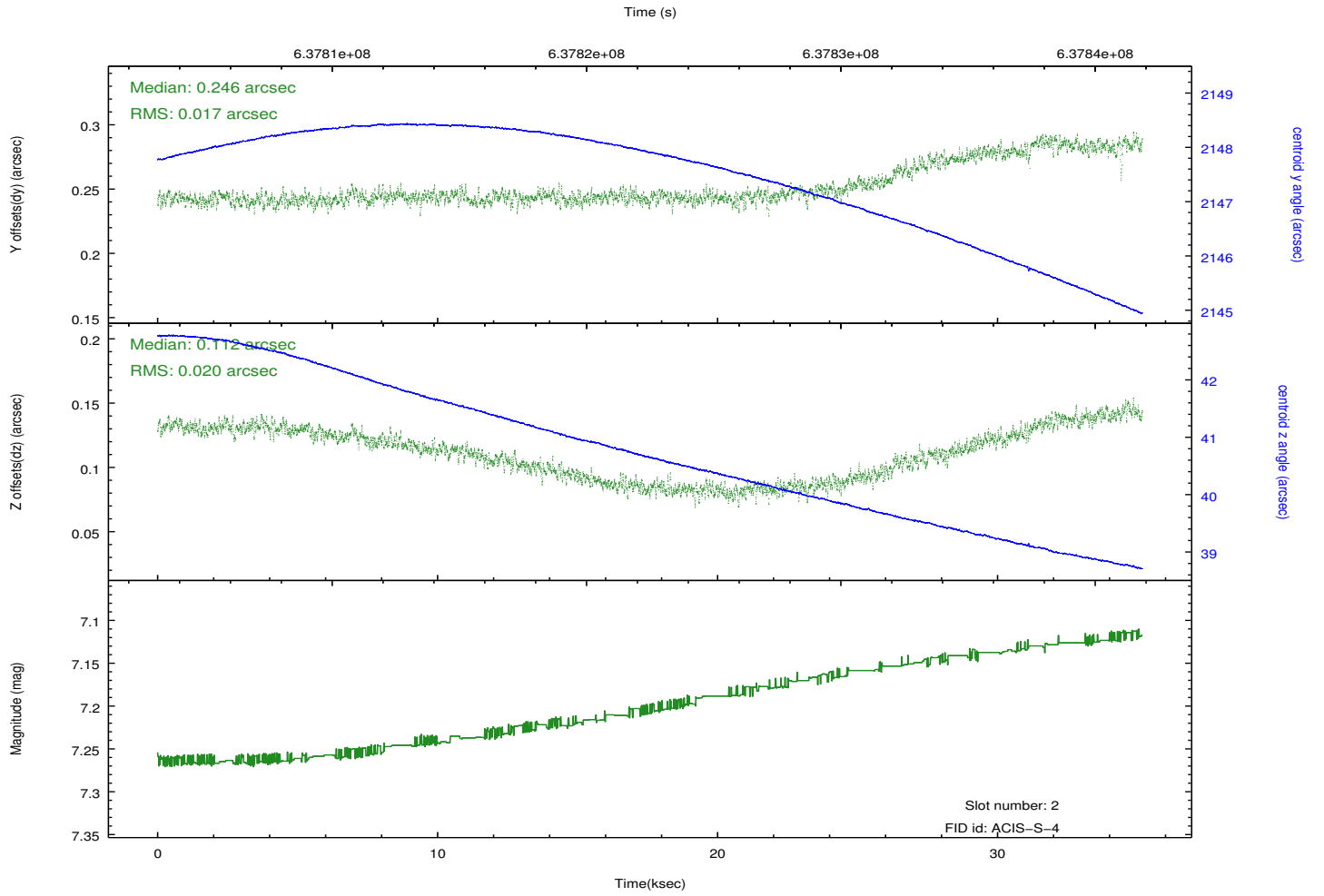
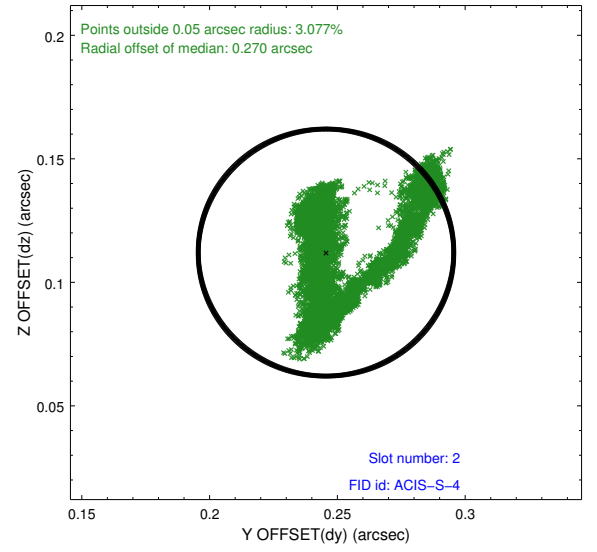
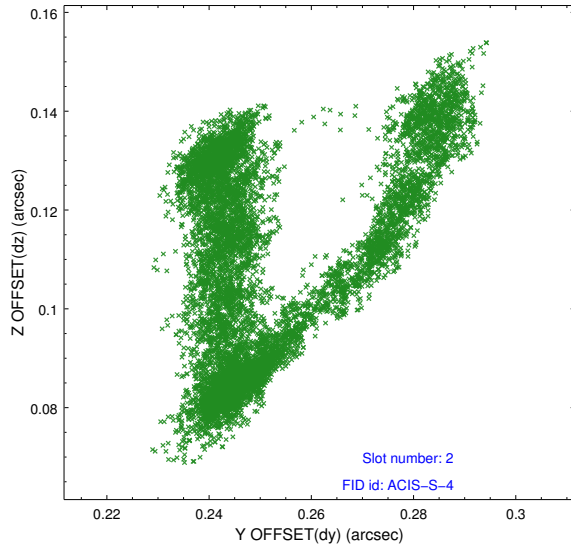
2.5.1 Slot 0



2.5.2 Slot 1

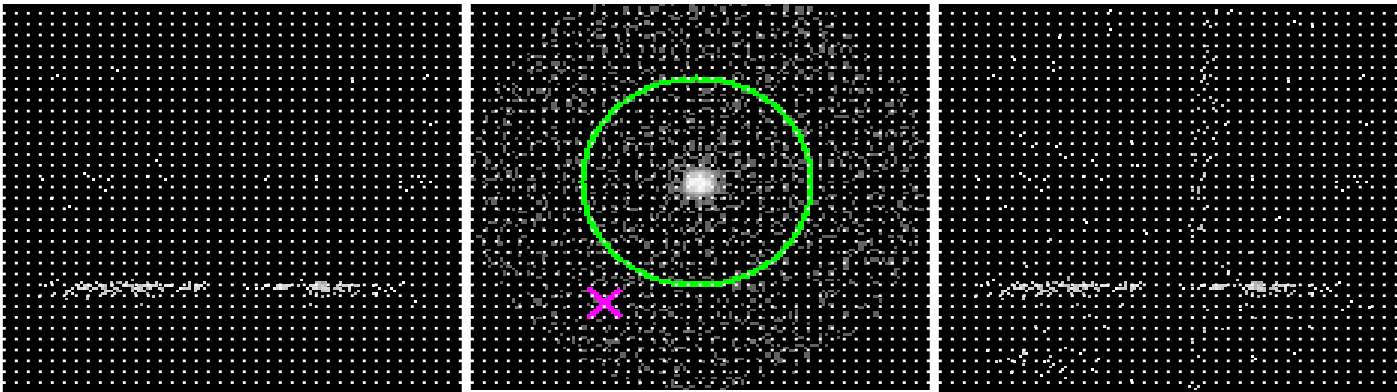


2.5.3 Slot 2



3 Gratings

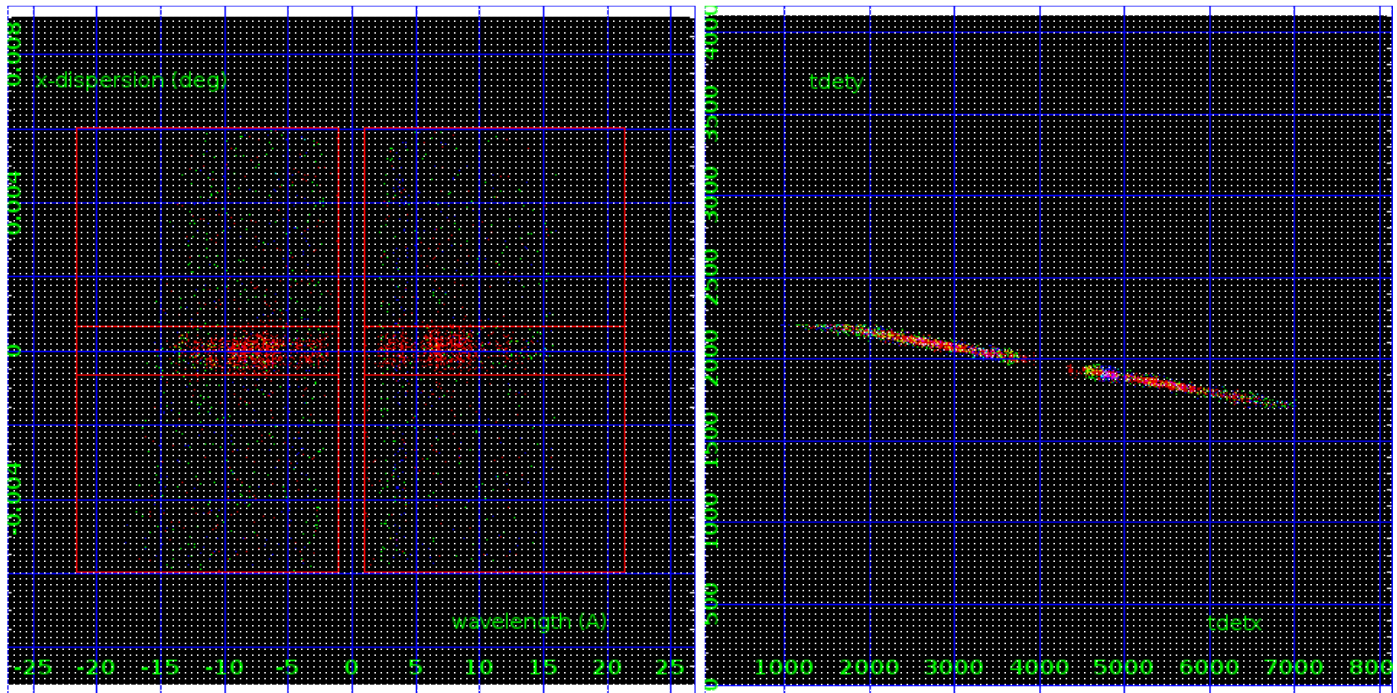
3.1 HEG Arm



HEG Order Sort 123

HEG Zero Order

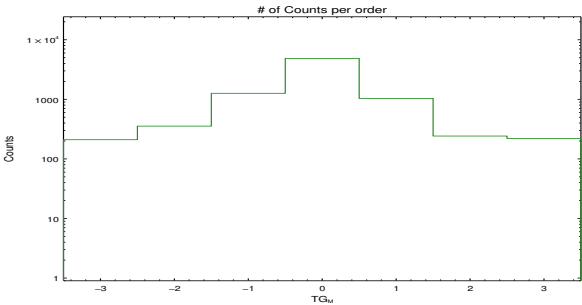
HEG Order Sort ALL

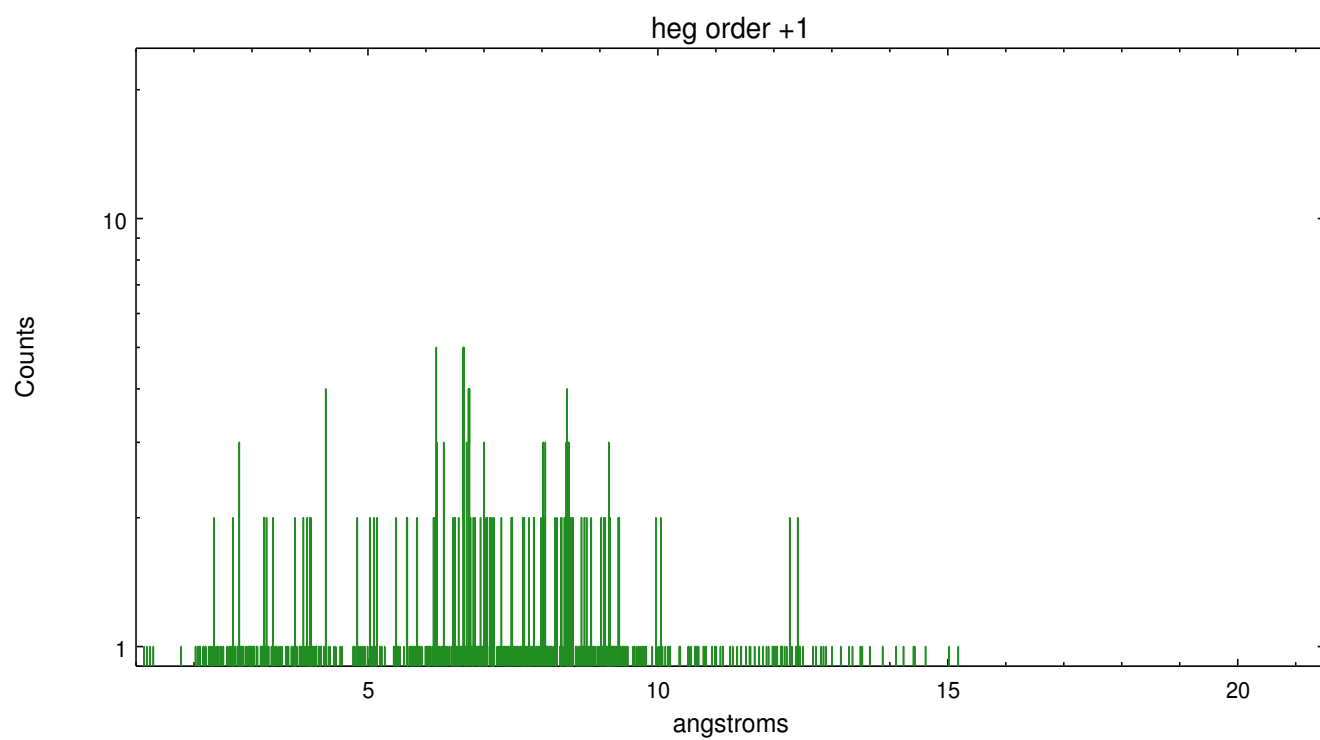
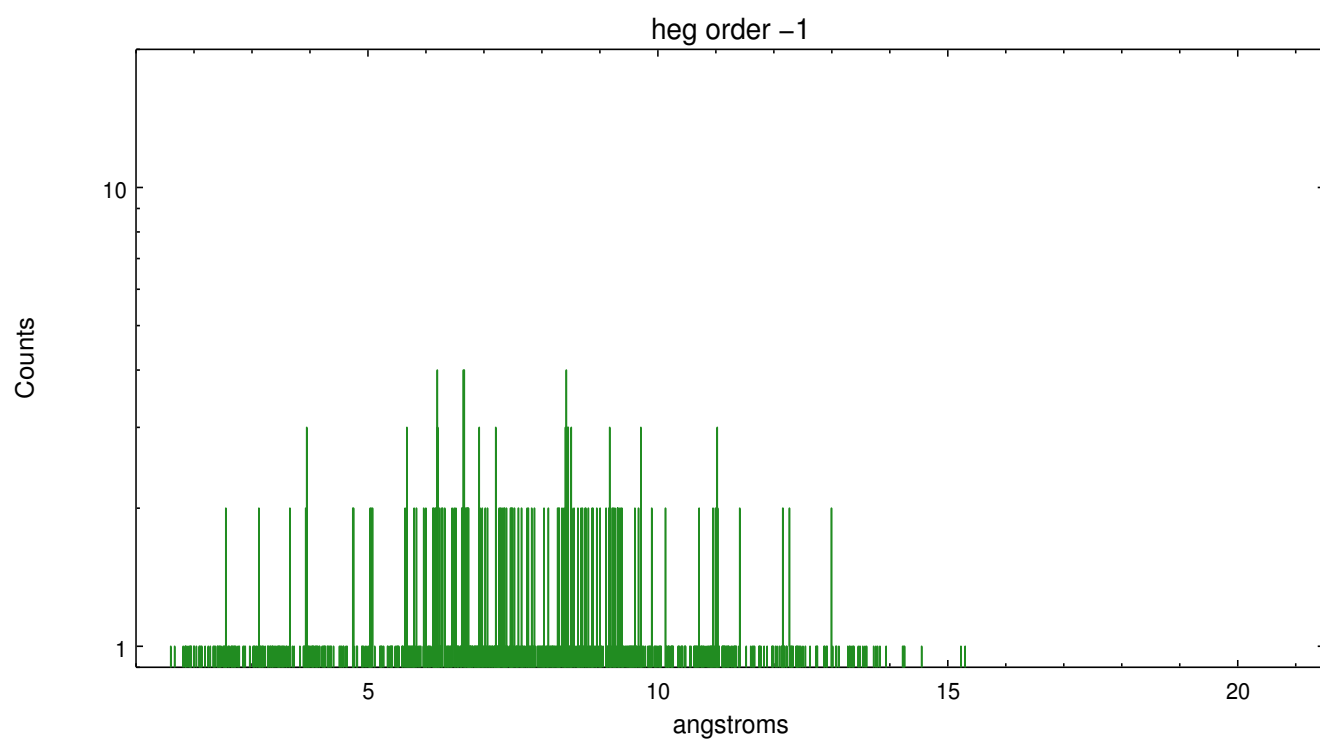


Spot Image HEG

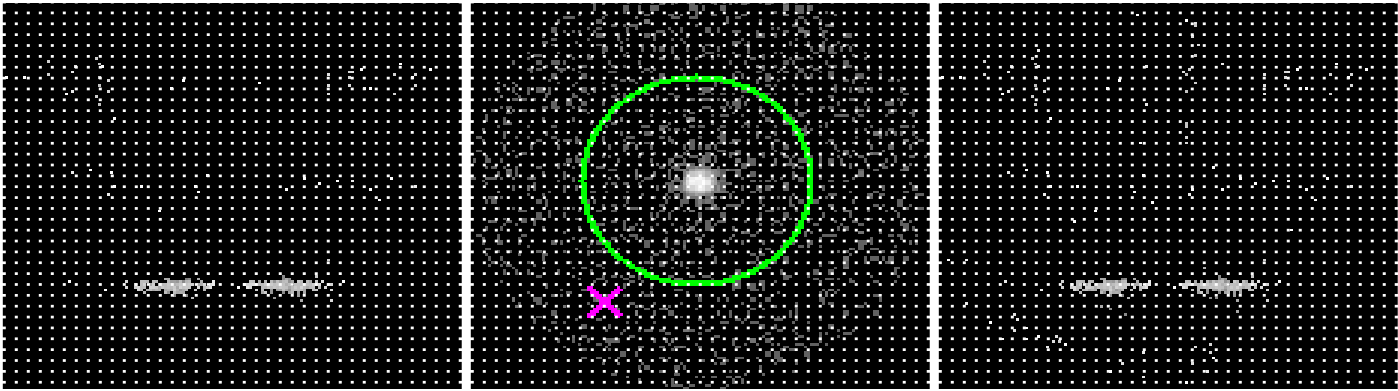
Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	210	355	1262	4860	1037	242	220





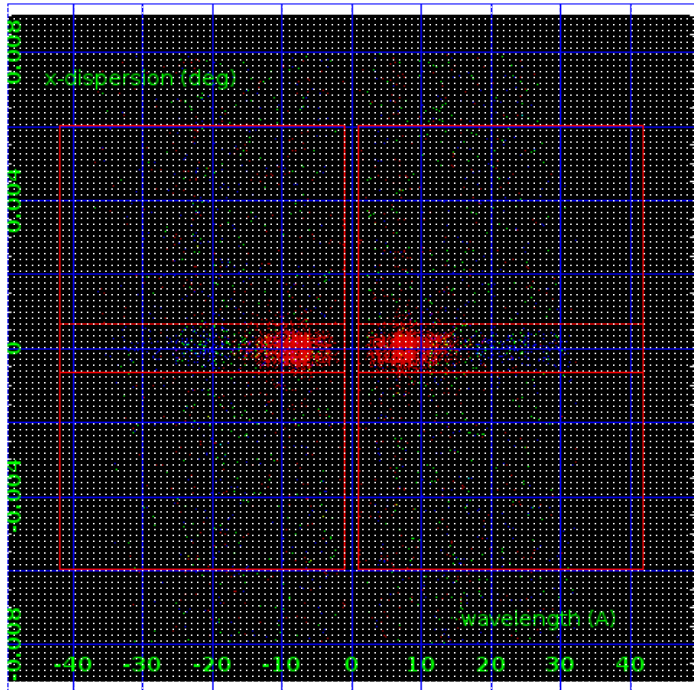
3.2 MEG Arm



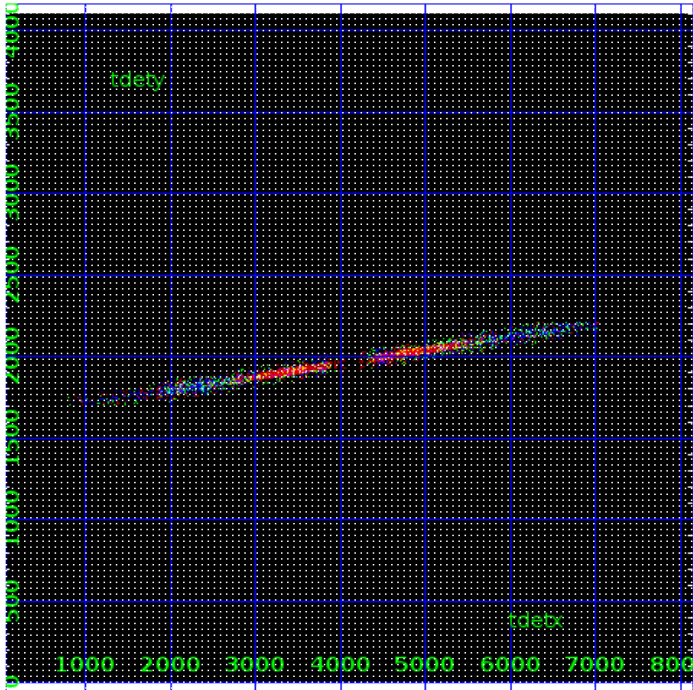
MEG Order Sort 123

MEG Zero Order

MEG Order Sort ALL

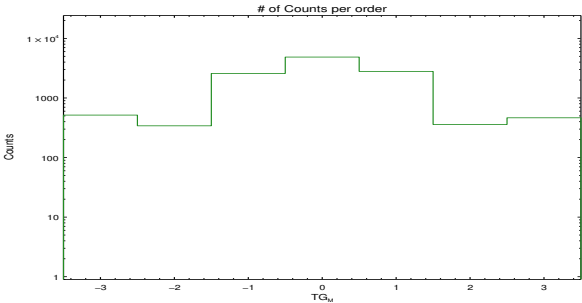


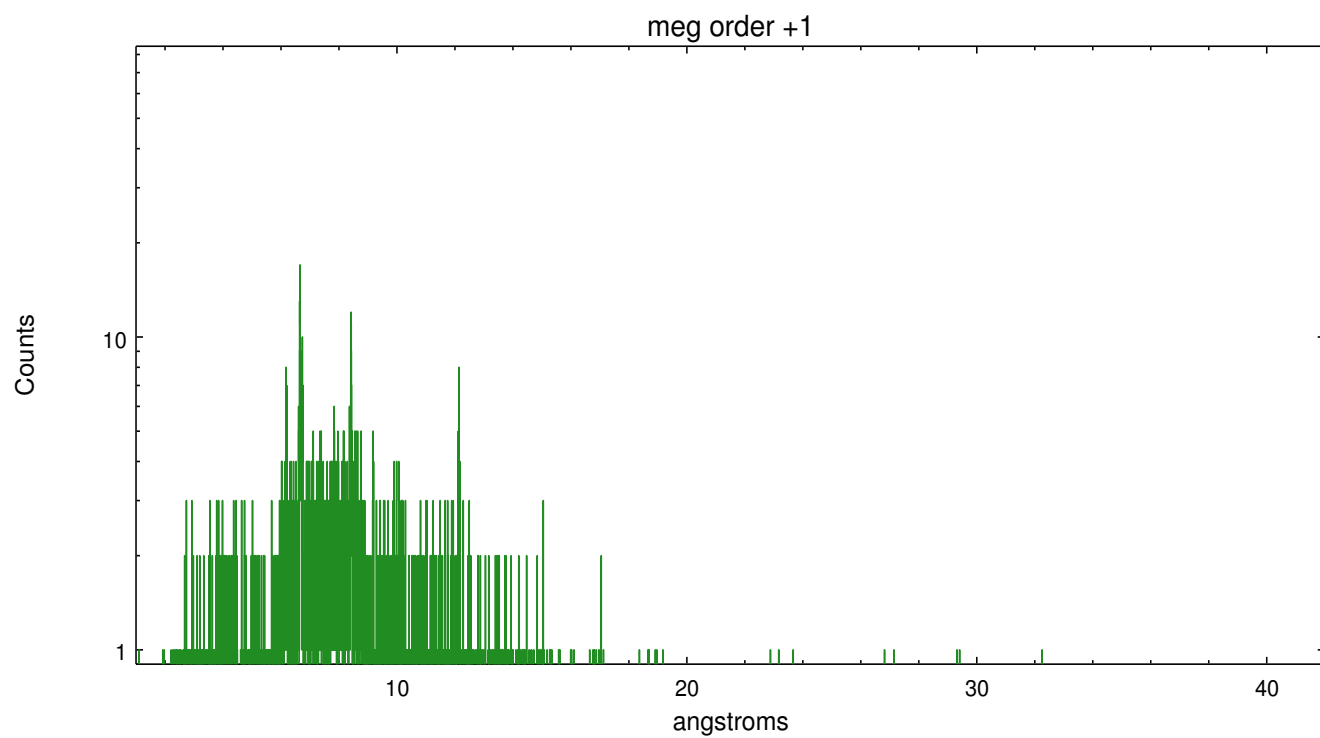
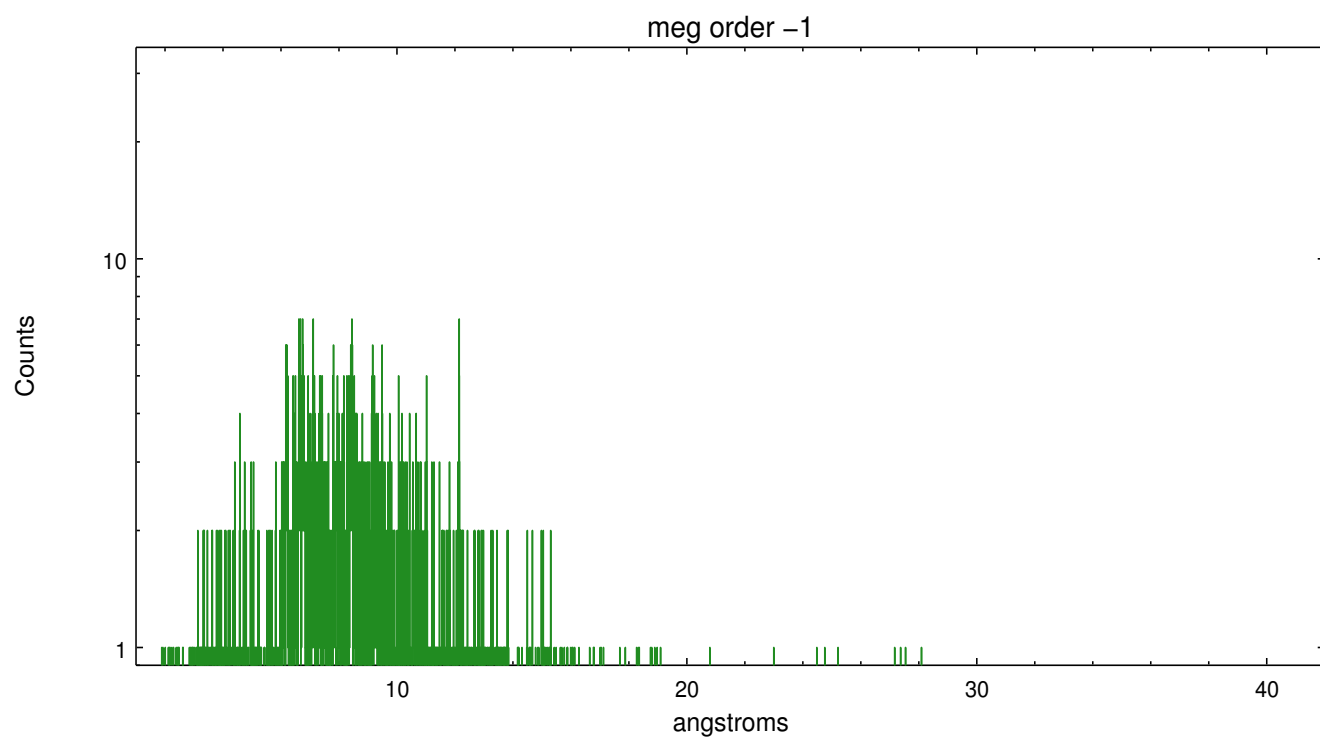
Spot Image MEG



Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	516	341	2579	4860	2793	359	465





A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2018.03.19
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	35.043800982952

A.2 Comments

Roll constraint met. WARNING: there are no standard ciao tools for analysis of grating spectra from extended sources. The shape of an emission line will be the shape of the zero order spatial structure convolved with the instrumental LSF. Grating extractions can be used, but need to be combined with custom spatial-spectral analysis, since wavelength is multi-valued at any particular diffraction angle.
====WARNING::Zeroth order selected by pipeline tools is well-centered in the supernova remnant but is not at the position(s) of brightest emission. The user may want to select a region or source of interest, then use software tools such as CIAO to specify the coordinates of the zeroth order source of interest before running the tools to resolve the dispersed events

=====

WARNING: The focal plane temperature during the first 4 ks of this observation was warmer than the upper limit for optimum calibration of the ACIS gain and spectral resolution (i.e., -114.0 C for ACIS-I and -112.0 C for ACIS-S).

The Chandra calibration team calibrates the ACIS gain and spectral resolution using data from the external calibration source (ECS). ECS data show that the frontside-illuminated (FI) CCDs are more temperature sensitive than the backside-illuminated (BI) CCDs.

A summary of the current calibration status of the ACIS gain and spectral resolution can be found at:

http://asc.harvard.edu/cal/Acis/Cal_prods/Gain_and_Spectral_Resolution/A_CIS_response_summary.html

The main points are:

- 1) The gain on BI chips remains within 0.3% (i.e., the systematic uncertainty in the ACIS gain quoted on the Chandra Calibration Status Summary web page) at all measured temperatures.
- 2) The gain on FI chips remains within 0.3% below row 600 at all measured temperatures.
- 3) The gain on FI chips above row 600 can be underestimated by as much as 1% for focal plane temperatures exceeding -116 C.
- 4) The spectral resolution (i.e., FWHM) on BI chips is insensitive to the focal plane temperature.

5) Warmer focal plane temperatures increase the FWHM on FI chips by up to 30 eV near row 512 and by up to 70 eV near the top of the chips.

In summary, the user should be cautious in the spectral analysis of high S/N emission lines detected on the top half of FI chips in this observation. Default processing with the current version of the CALDB will underestimate photon energies by up to 1% and broaden emission lines by up to 70 eV.