

V&V Reference Report

L2 ASCDS Version : 10.7.1

Observation 22222 - L2 Version 2
Chandra X-Ray Center

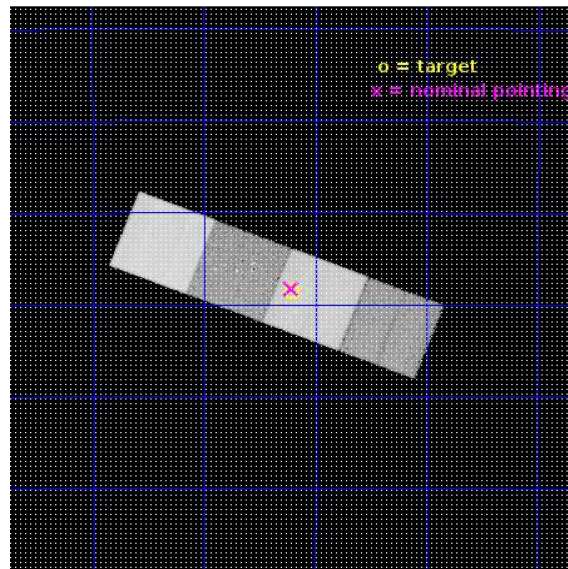
L2 Processing Date : May 21 2019

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1 Front

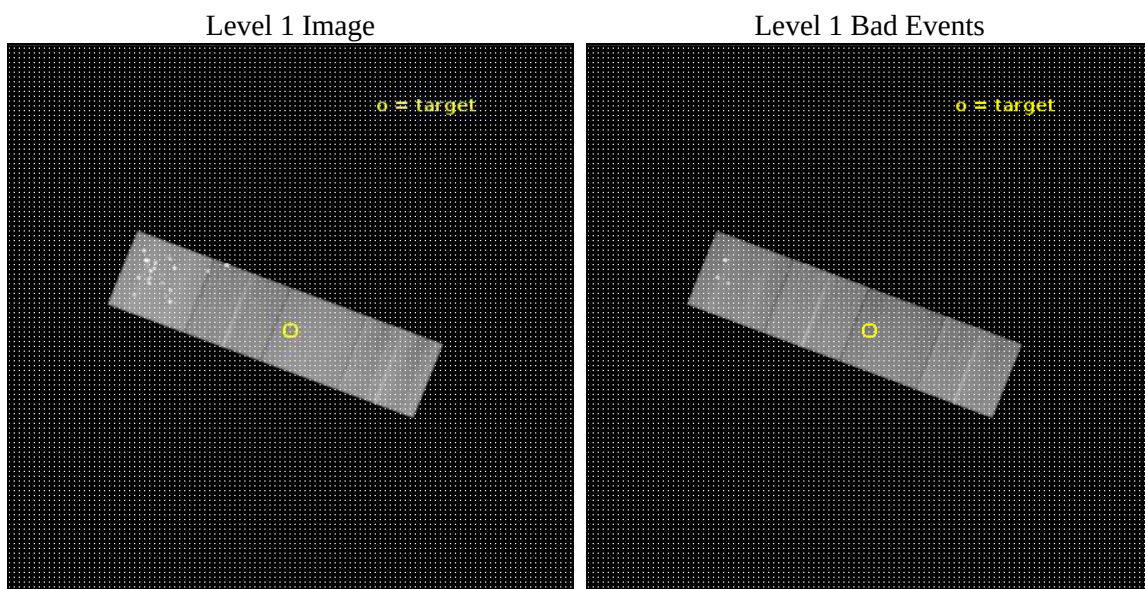
seq_num	201260	Sequence number
obs_id	22222	Observation id
title	Identifying Accretion at a Key Stage of Pre-main Sequence Stellar Evolution	Proposal title
observer	Dr. Claude Canizares	Principal investigator
object	SZ 96	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	242.052667	Observer's specified target RA [deg]
dec_targ	-39.142633	Observer's specified target Dec [deg]
ra_nom	242.05384622355	Nominal RA [deg]
dec_nom	-39.138183668673	Nominal Dec [deg]
roll_nom	21.157392176528	Nominal Roll [deg]
revision	2	Processing version of data
ontime	44020.000338674	Sum of GTIs [s]
livetime	43444.846627196	Livetime [s]
ontime5	44020.000338674	Sum of GTIs [s]
ontime6	44020.000338674	Sum of GTIs [s]
ontime7	44020.000338674	Sum of GTIs [s]
ontime8	44020.000338674	Sum of GTIs [s]
l2events	475430	Number of level 2 events



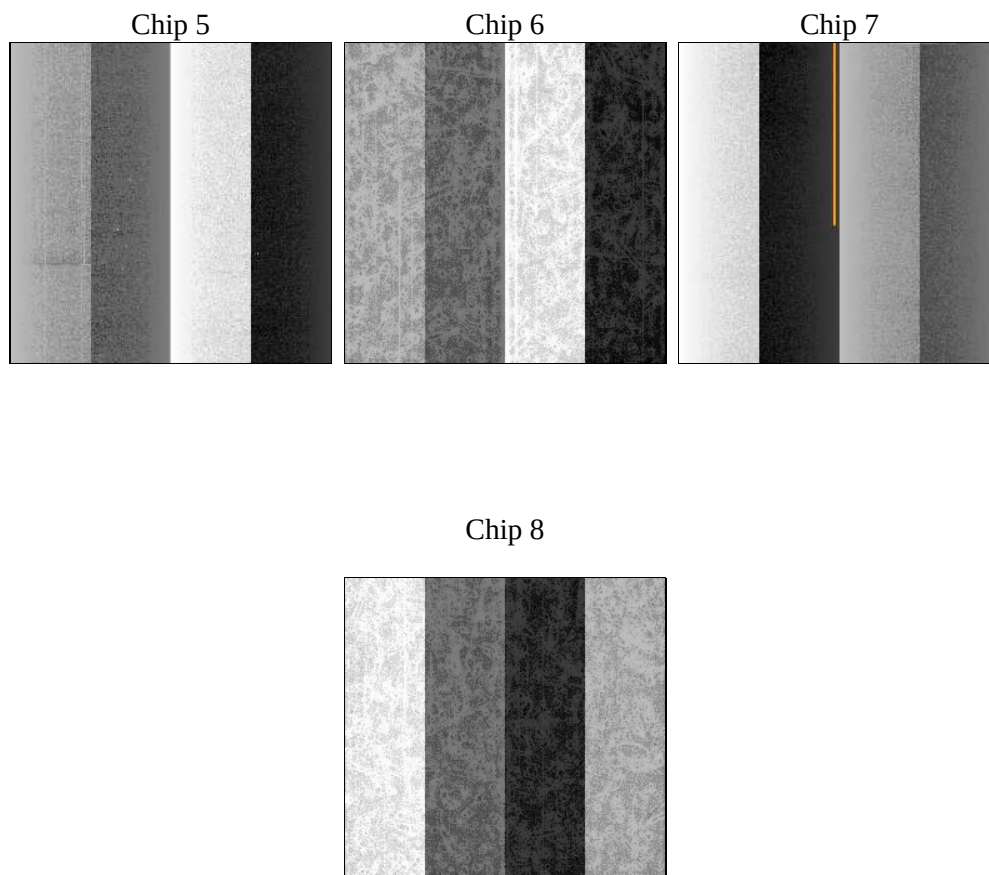
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	44000.000000	[s] Scheduled observation exposure time
ascdsver	10.7.1	Processing system revision	ontime	44020.000338674	Sum of GTIs [s]
caldsver	4.8.2	 	ontime5	44020.000338674	Sum of GTIs [s]
date	2019-05-17T05:49:06	Date and time of file creation	ontime6	44020.000338674	Sum of GTIs [s]
revision	1	Processing version of data	ontime7	44020.000338674	Sum of GTIs [s]
			ontime8	44020.000338674	Sum of GTIs [s]
			l1events	1863445	Number of level 1 events
			tgmethod	MANUAL	Method used to create src1a file
			zo_pos	(4104.67, 4062.88)	src1a sky pixel position

2.1.4 Events

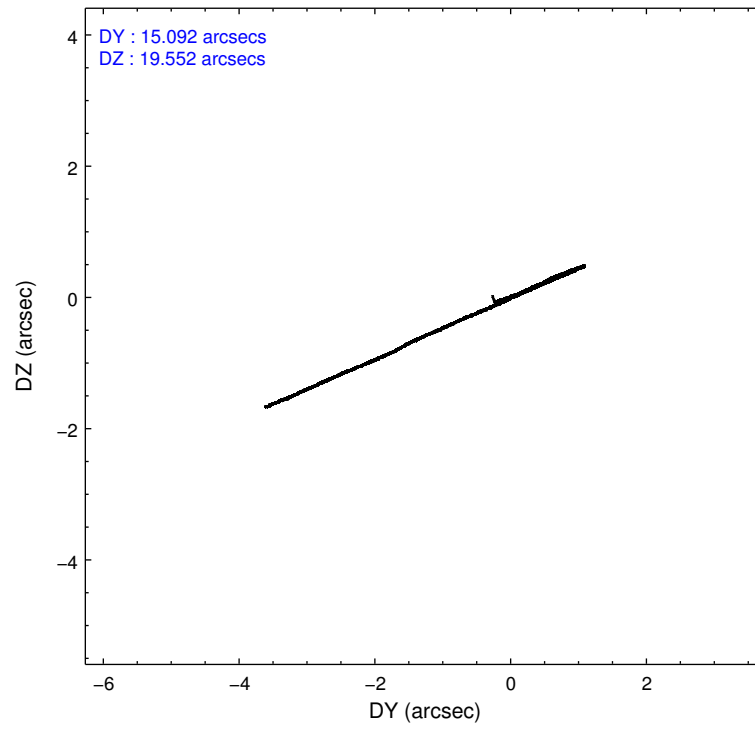
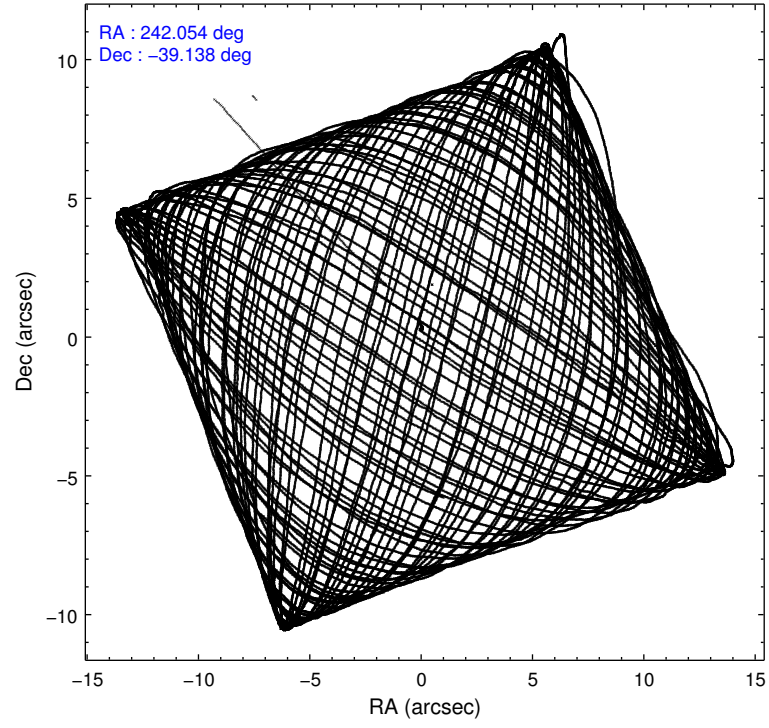
	ccd 5	ccd 6	ccd 7	ccd 8
level 1 events	667156	360171	417476	418642
rejected events	296676	308207	238299	312747
rejected %	44%	85%	57%	74%

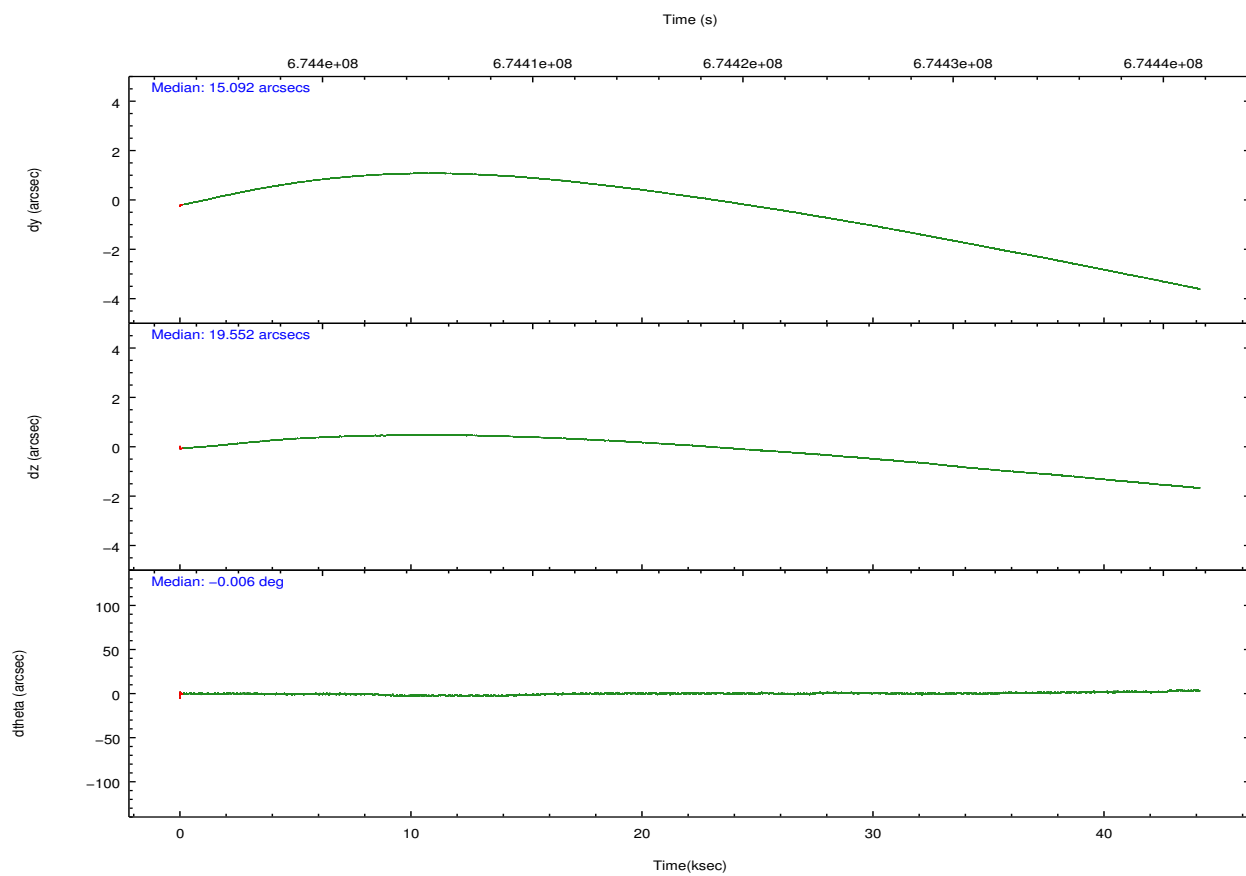
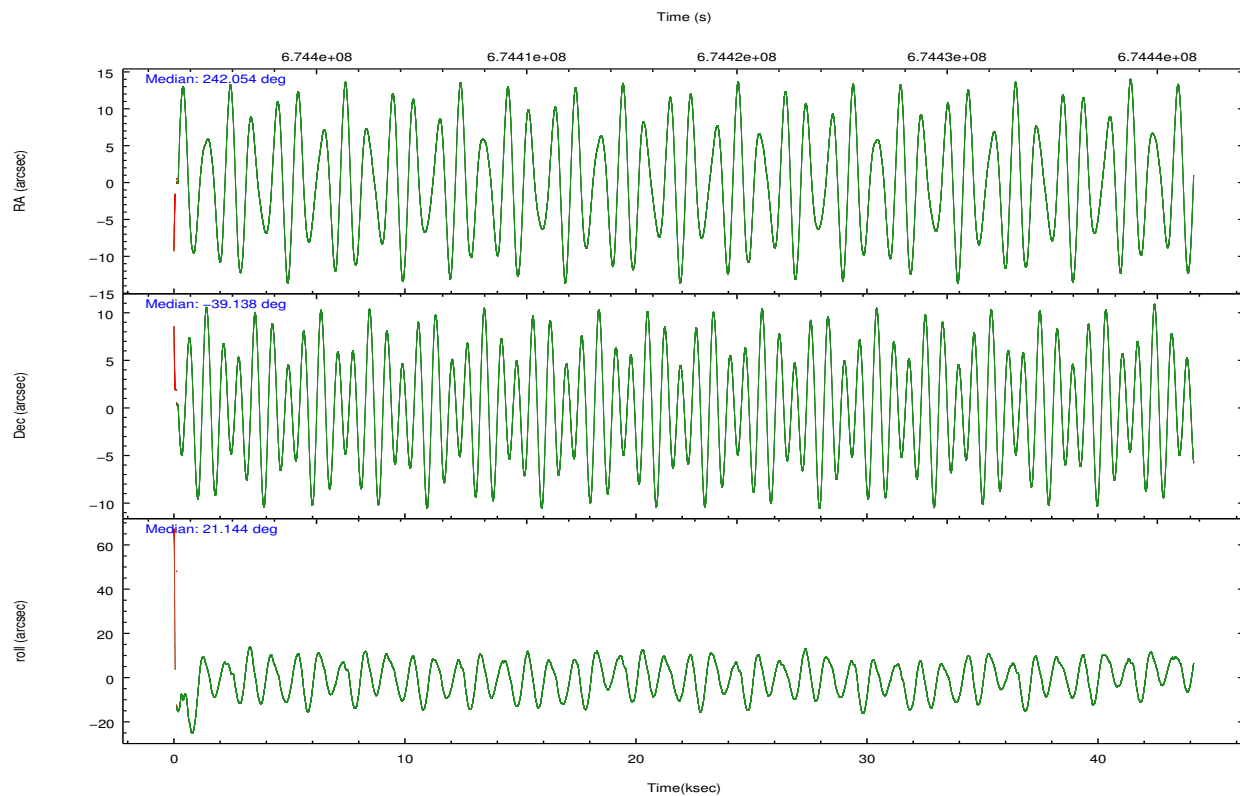
	ccd 5	ccd 6	ccd 7	ccd 8
grade 0 events	113994	25192	14950	28732
	17%	6%	3%	6%
grade 1 events	1405	194	622	308
	0%	0%	0%	0%
grade 2 events	93423	10487	37761	26480
	14%	2%	9%	6%
grade 3 events	12348	3051	13677	10996
	1%	0%	3%	2%
grade 4 events	10685	3044	13716	10082
	1%	0%	3%	2%
grade 5 events	38552	13457	39853	21705
	5%	3%	9%	5%
grade 6 events	140376	10257	99262	29725
	21%	2%	23%	7%
grade 7 events	256373	294489	197635	290614
	38%	81%	47%	69%

2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-5678	ACIS-5678	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	242.032015	242.0538462235532	CCD I2 on	N	N
[deg] Pointing Dec	-39.159778	-39.13818366867307	CCD I3 on	N	N
[deg] Pointing Roll	20.986965	21.15739217652806	CCD S0 on	O2	N
[mm] SIM focus pos	-0.684267	-0.6828225247311905	CCD S1 on	Y	Y
[mm] SIM defocus	0	0.001444936568705701	CCD S2 on	Y	Y
[mm] SIM translation stage pos	-190.132523	-190.1400660498719	CCD S3 on	Y	Y
[mm] SIM translation stage offset	0	0.00754346686406393	CCD S4 on	Y	Y
[s] Observation start time (MET)	674395548.184000	674394517.97471	CCD S5 on	O1	N
Observation start date	2019-05-16T12:04:39	2019-05-16T11:48:37	Number of optional ACIS chips dropped	2	2
[s] Observation end time (MET)	674439548.184000	674440335.47745	On-chip summing requested	N	N
Observation end date	2019-05-17T00:17:59	2019-05-17T00:32:15	Subarray requested	NONE	NONE
Read mode	TIMED	TIMED	Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	3.1

2.3 Aspect



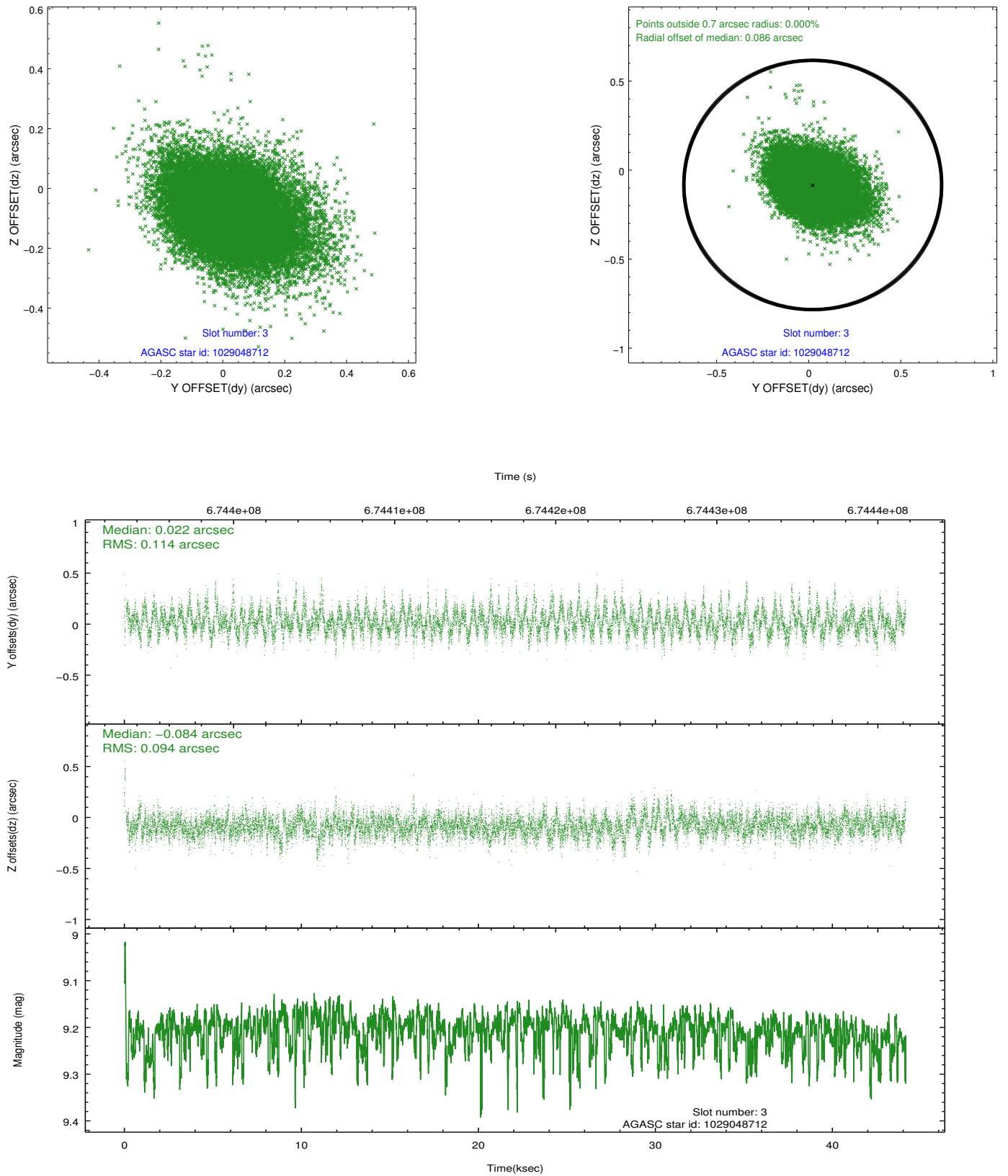


Slot Statistics

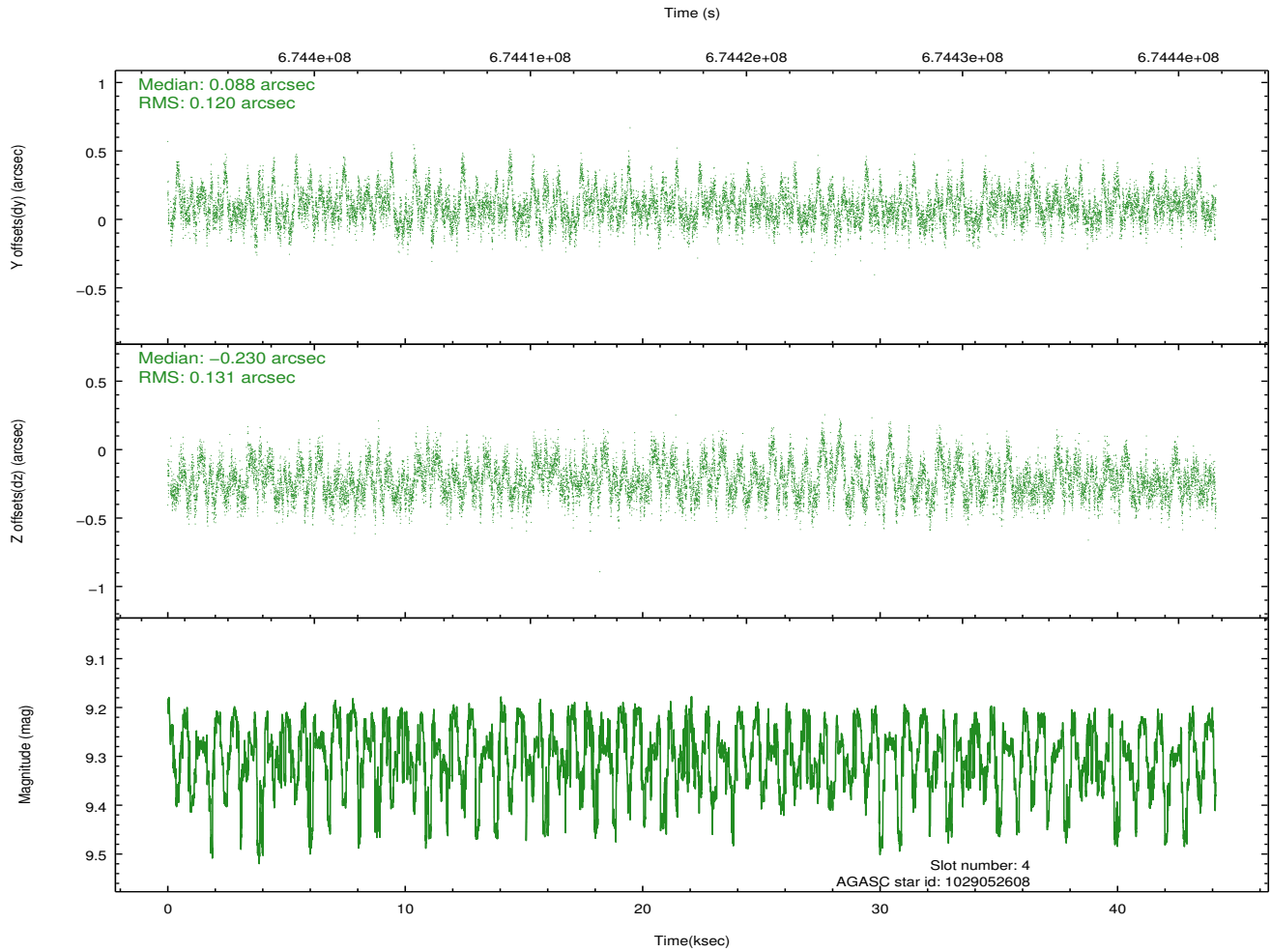
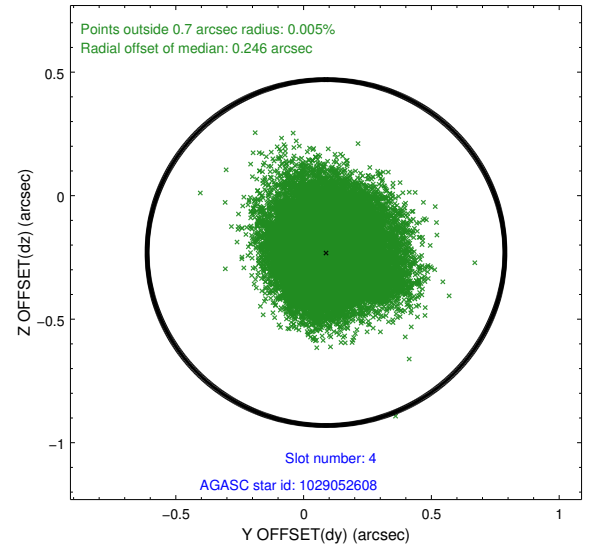
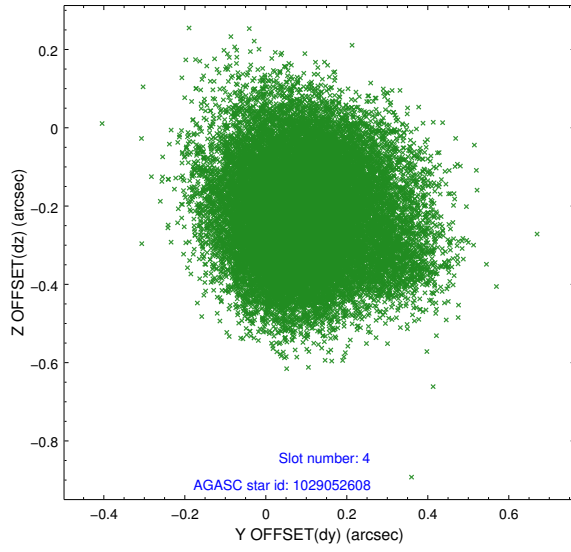
pt	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mea
0	FID		ACIS-S-2	7.14	10753	1.000	-0.349	-0.223	0.044	0.098	0.000000	0.000000	-767.84	-1741
1	FID		ACIS-S-4	7.26	10750	1.000	0.837	0.228	0.026	0.116	0.000000	0.000000	2146.51	167
2	FID		ACIS-S-5	7.21	10752	1.000	-0.525	0.007	0.033	0.050	0.000000	0.000000	-1820.95	161
3	GUIDE	used	1029048712	9.21	21486	1.000	0.022	-0.084	0.153	0.264	241.237794	-38.954366	-1814.72	1477
4	GUIDE	used	1029052608	9.30	21485	1.000	0.088	-0.230	0.191	0.301	241.909057	-39.099888	-243.86	324
5	GUIDE	used	1029059360	8.28	21490	1.000	-0.024	-0.019	0.115	0.196	241.638388	-39.259513	-1153.33	55
6	GUIDE	used	1029580280	9.14	21479	1.000	-0.103	0.326	0.155	0.259	242.322361	-39.646406	124.19	-1924
7	MONITOR	unused		0.00	0	0.000	0.000	0.000	0.000	0.000	0.000000	0.000000	0.00	0

2.4 Star Slots

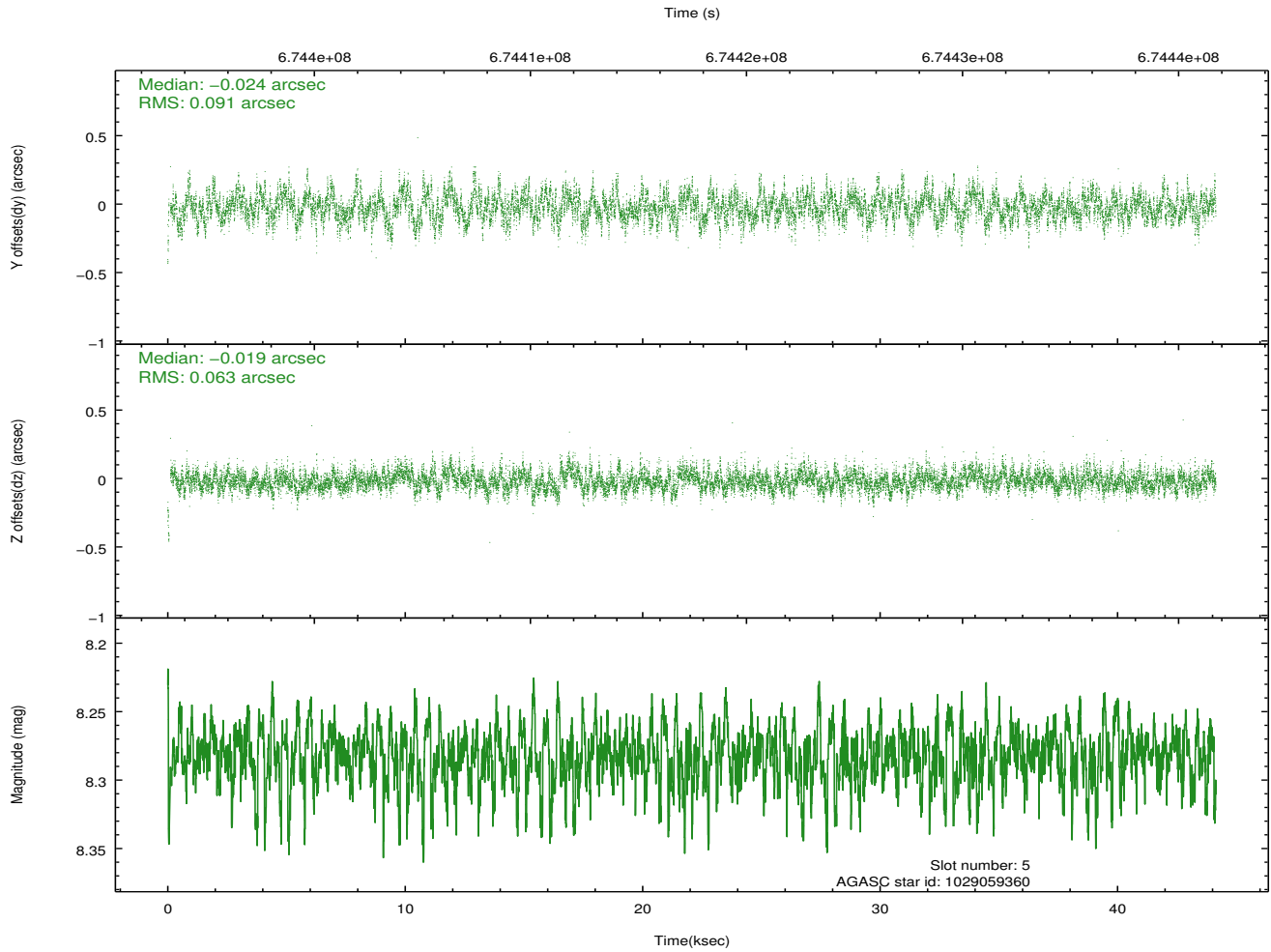
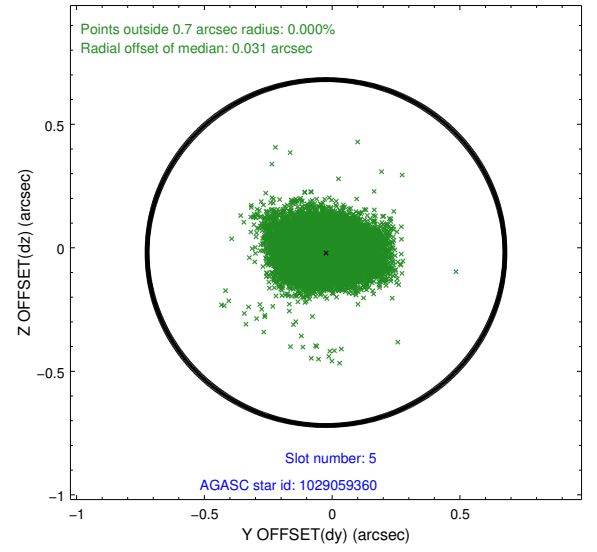
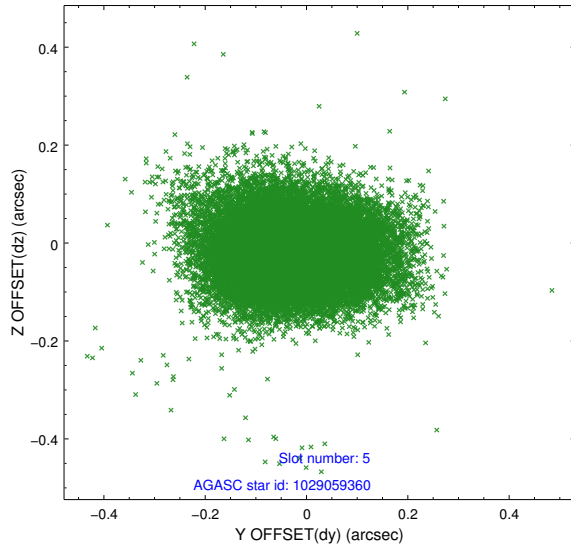
2.4.1 Slot 3



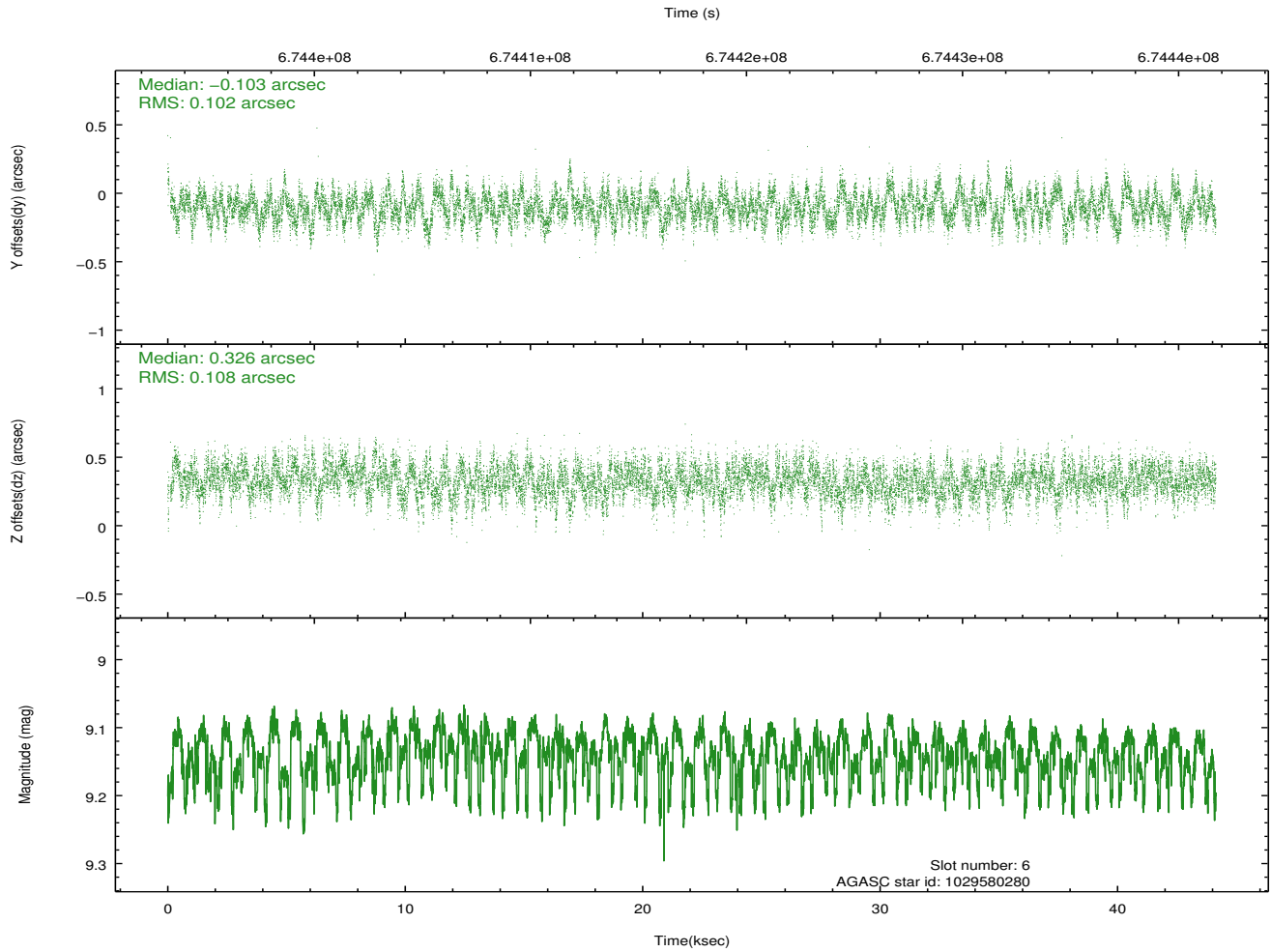
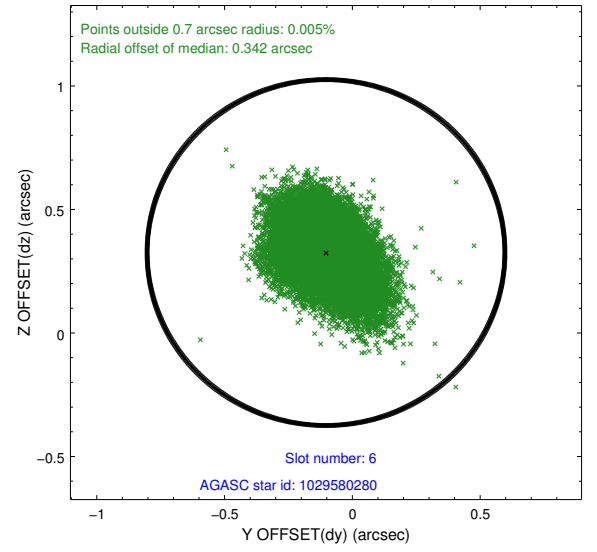
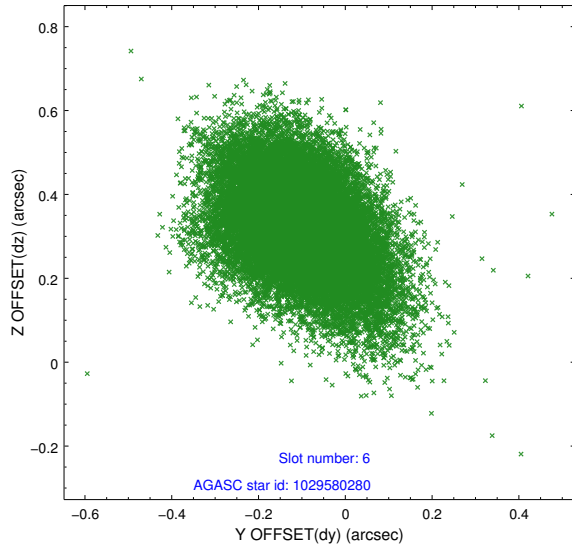
2.4.2 Slot 4



2.4.3 Slot 5

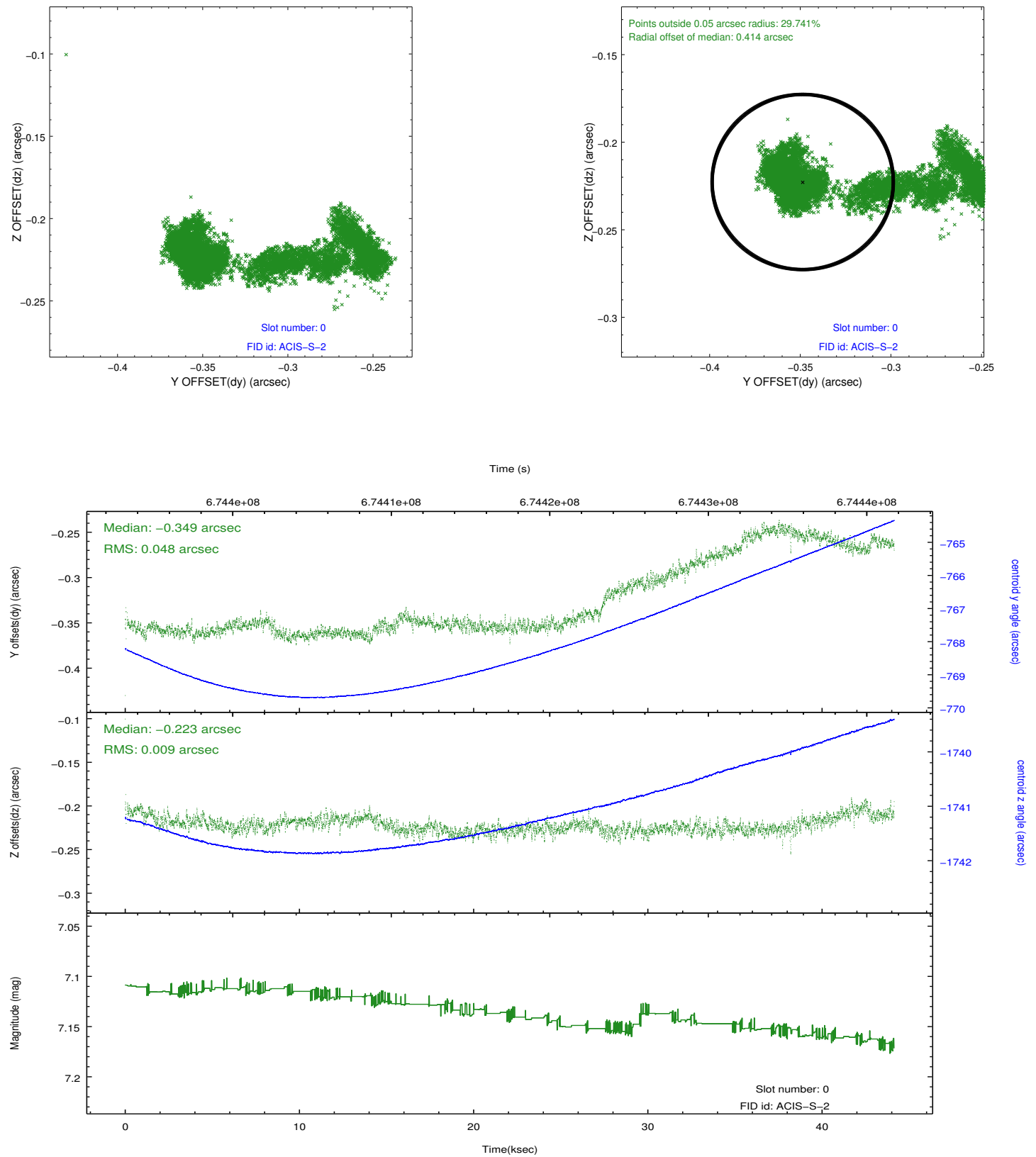


2.4.4 Slot 6

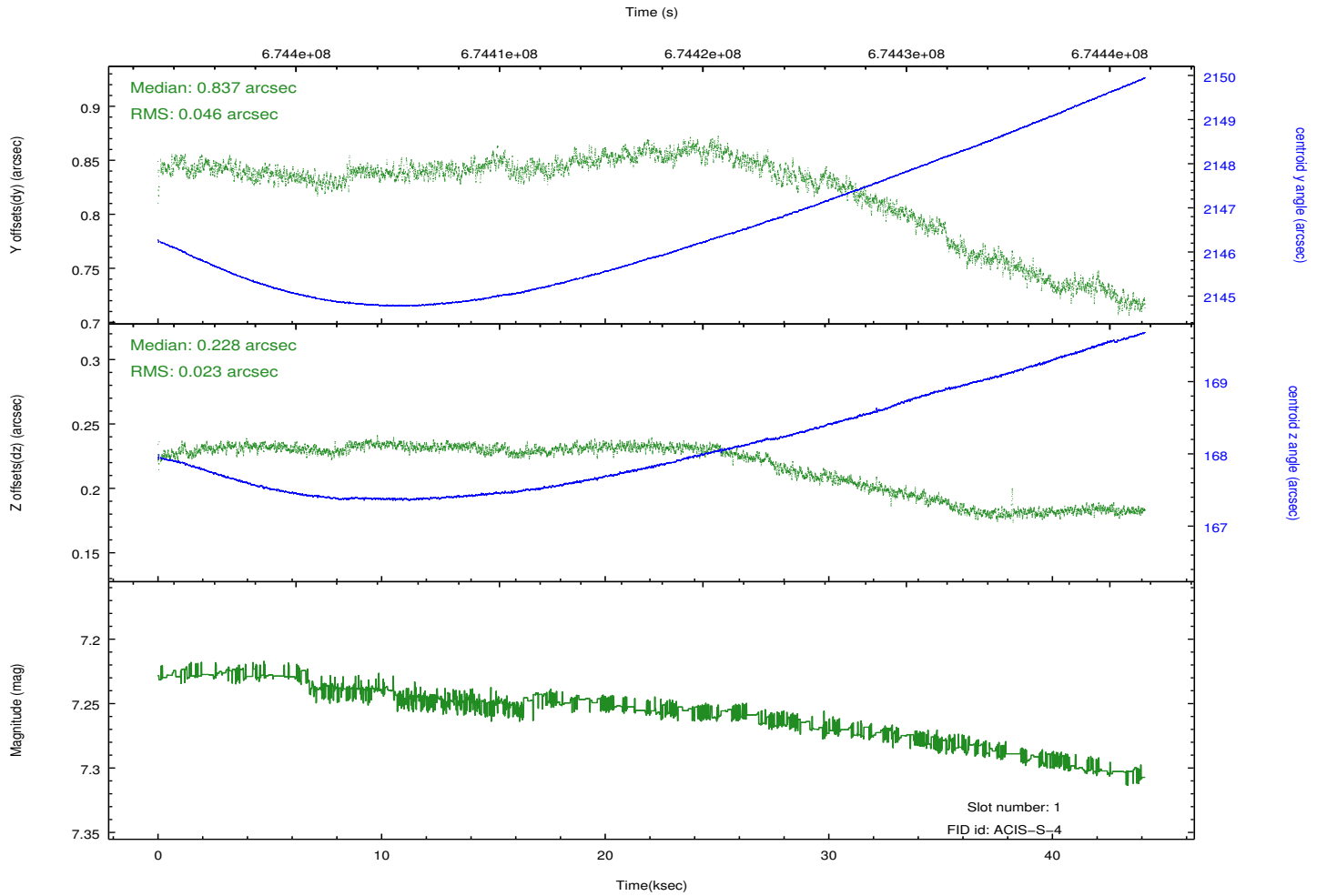
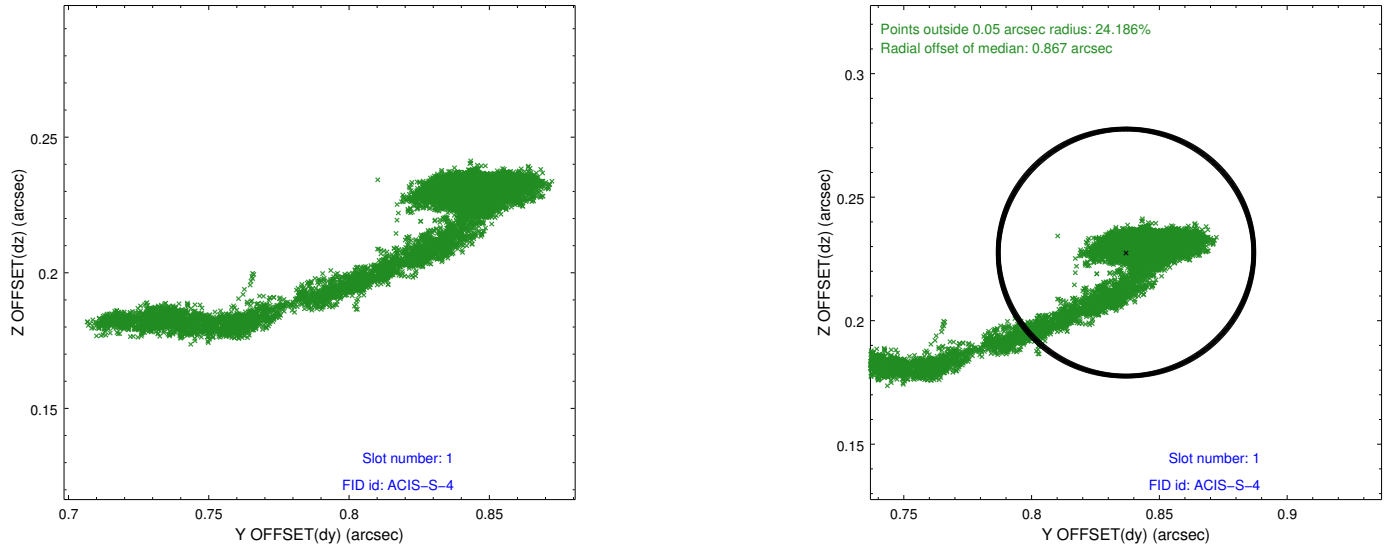


2.5 FID Slots

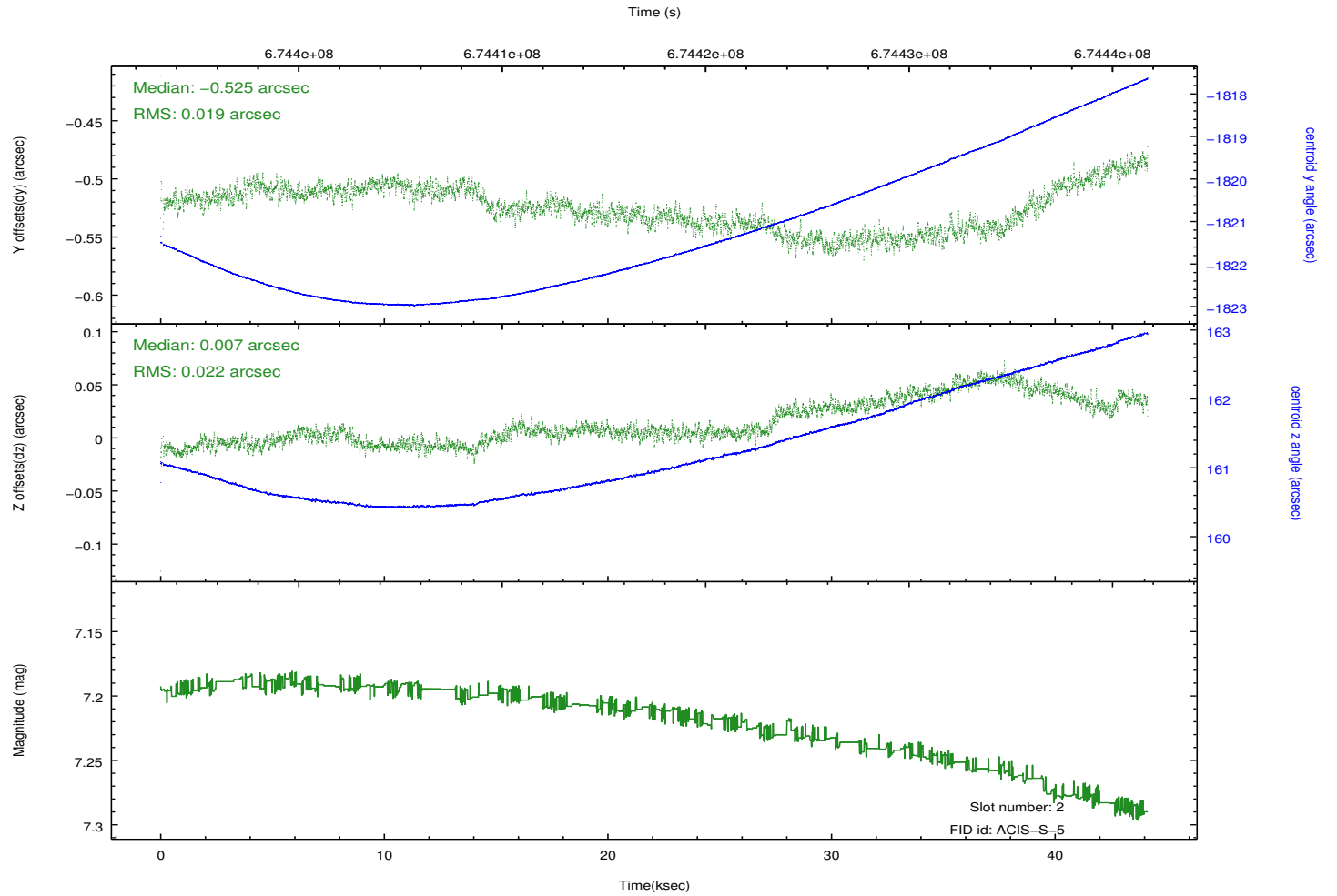
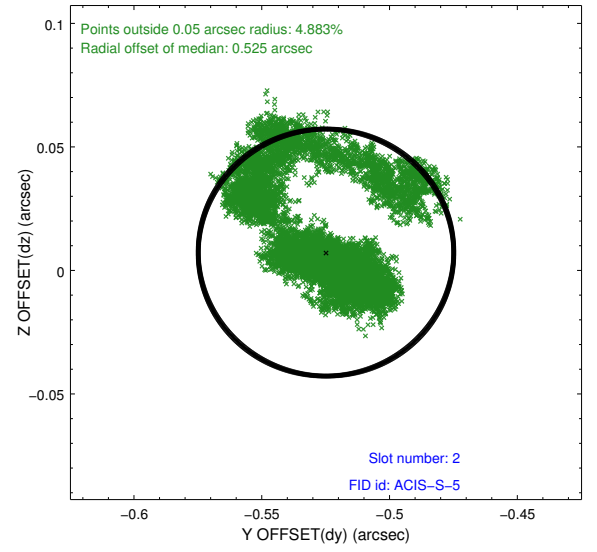
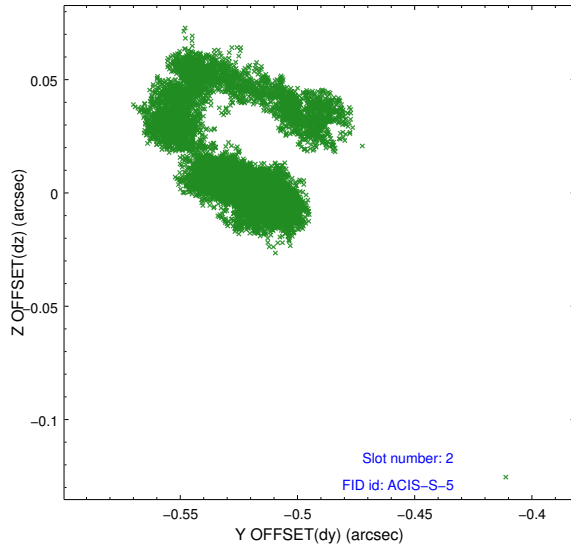
2.5.1 Slot 0



2.5.2 Slot 1

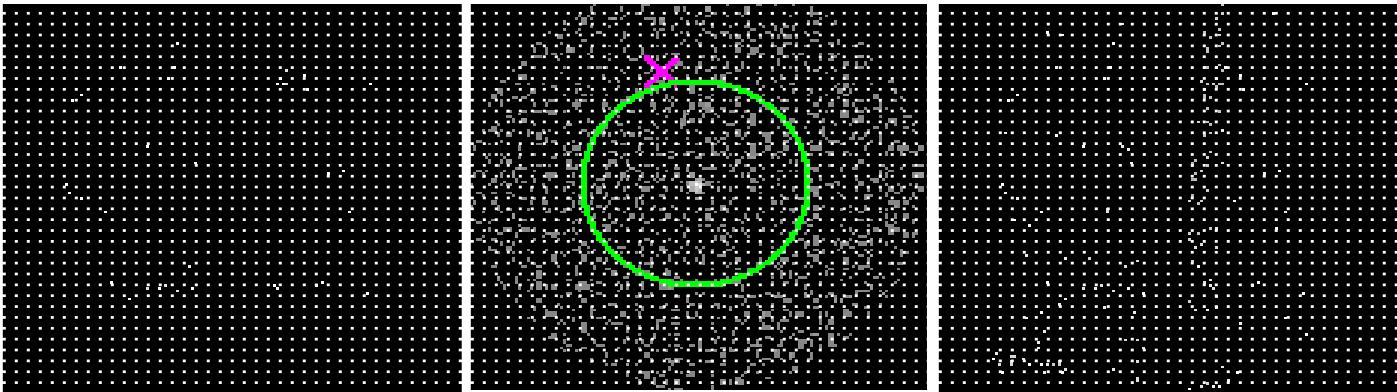


2.5.3 Slot 2



3 Gratings

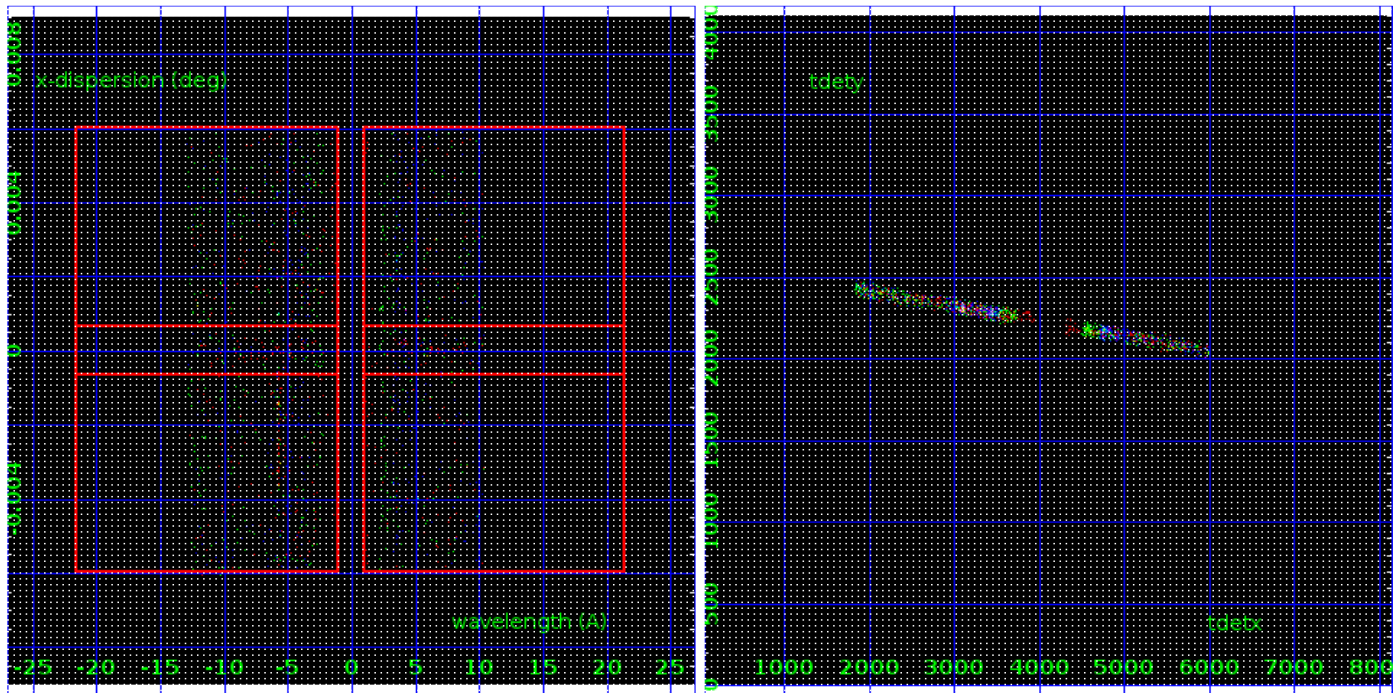
3.1 HEG Arm



HEG Order Sort 123

HEG Zero Order

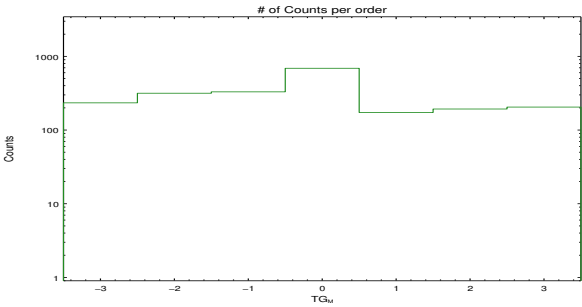
HEG Order Sort ALL

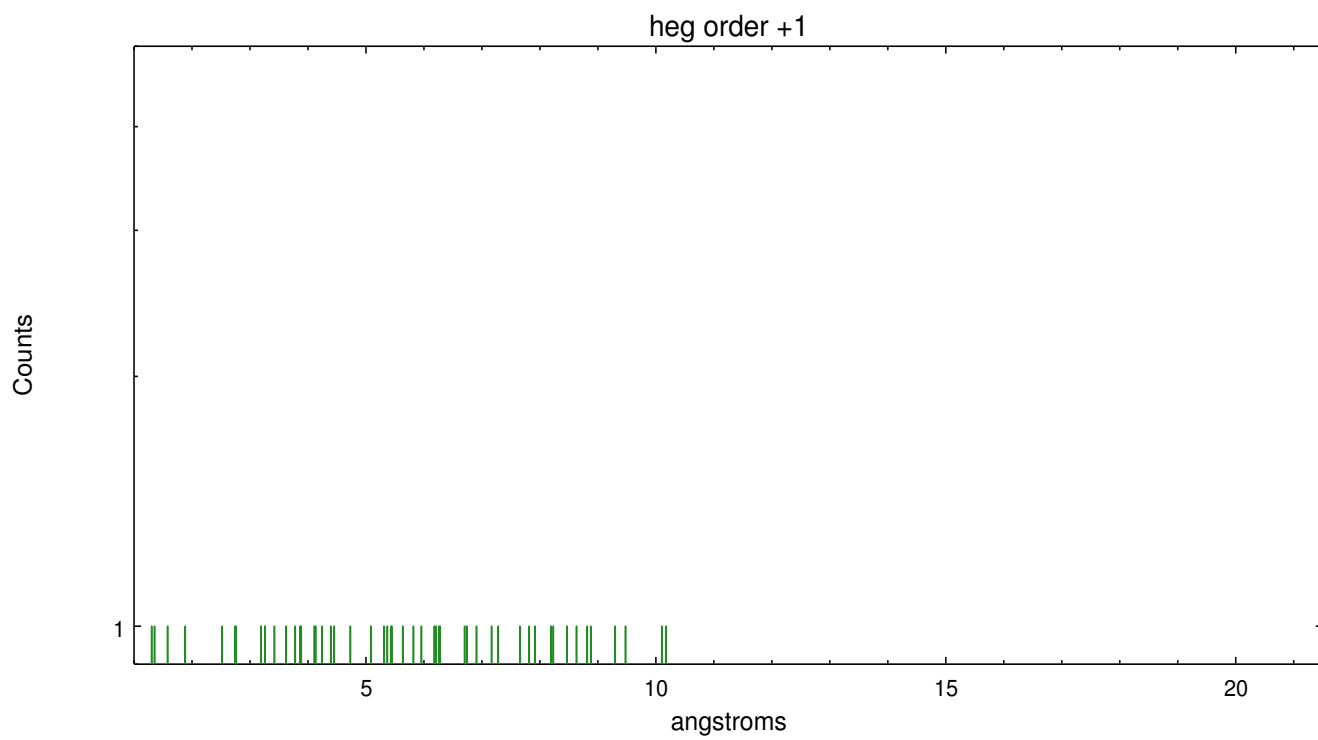
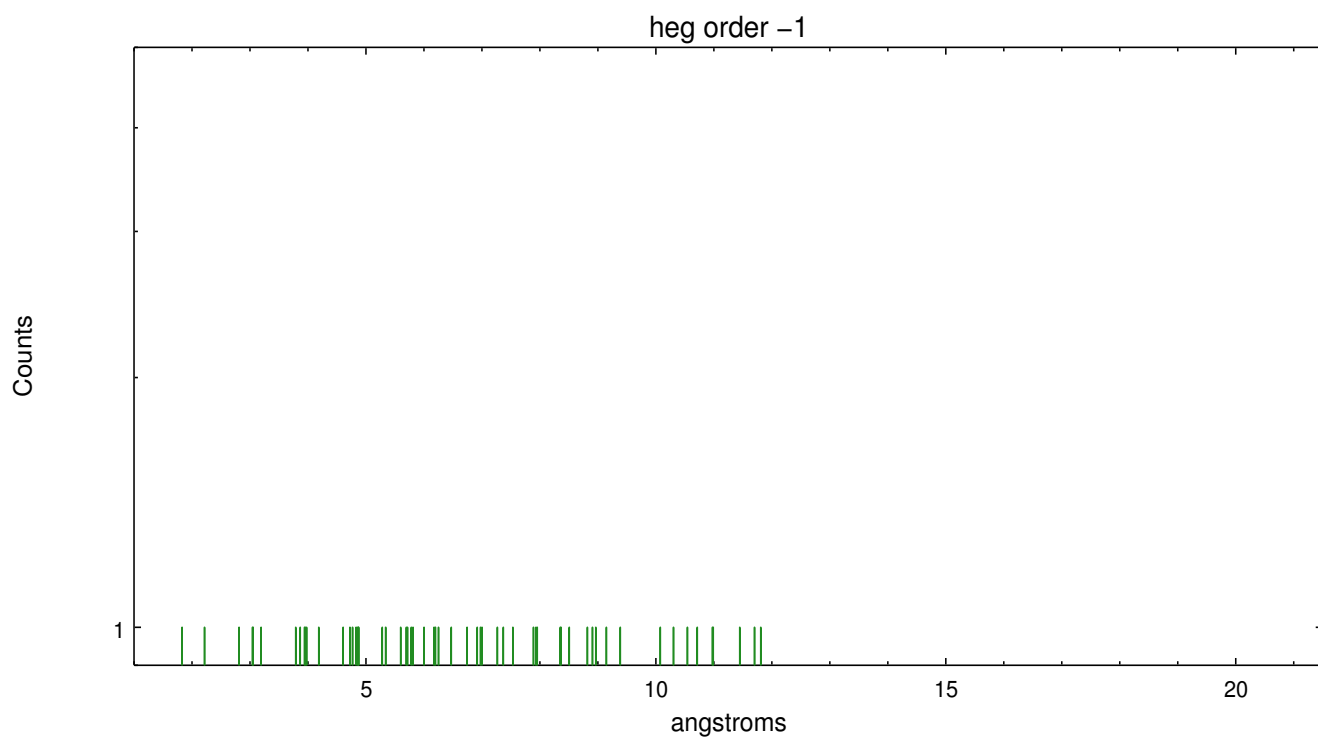


Spot Image HEG

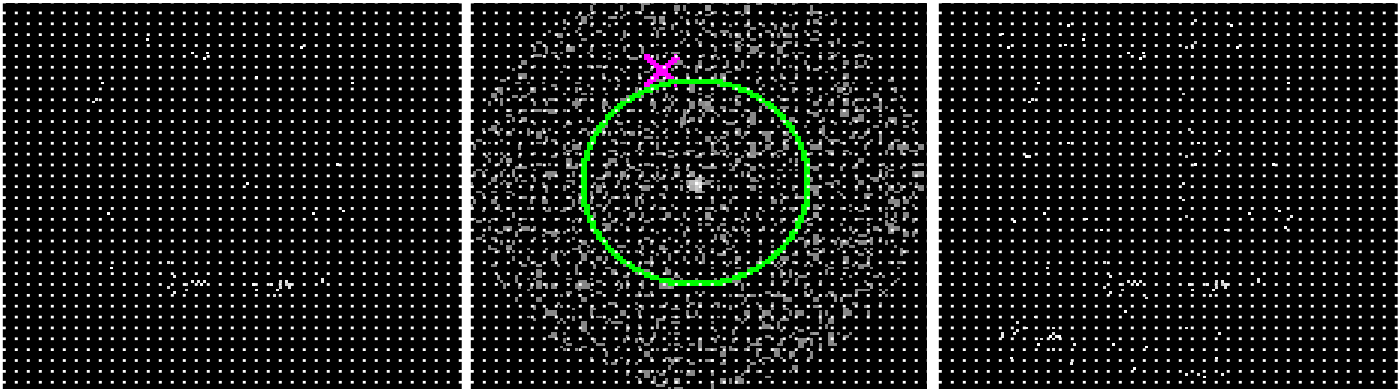
Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	234	316	330	689	173	193	205





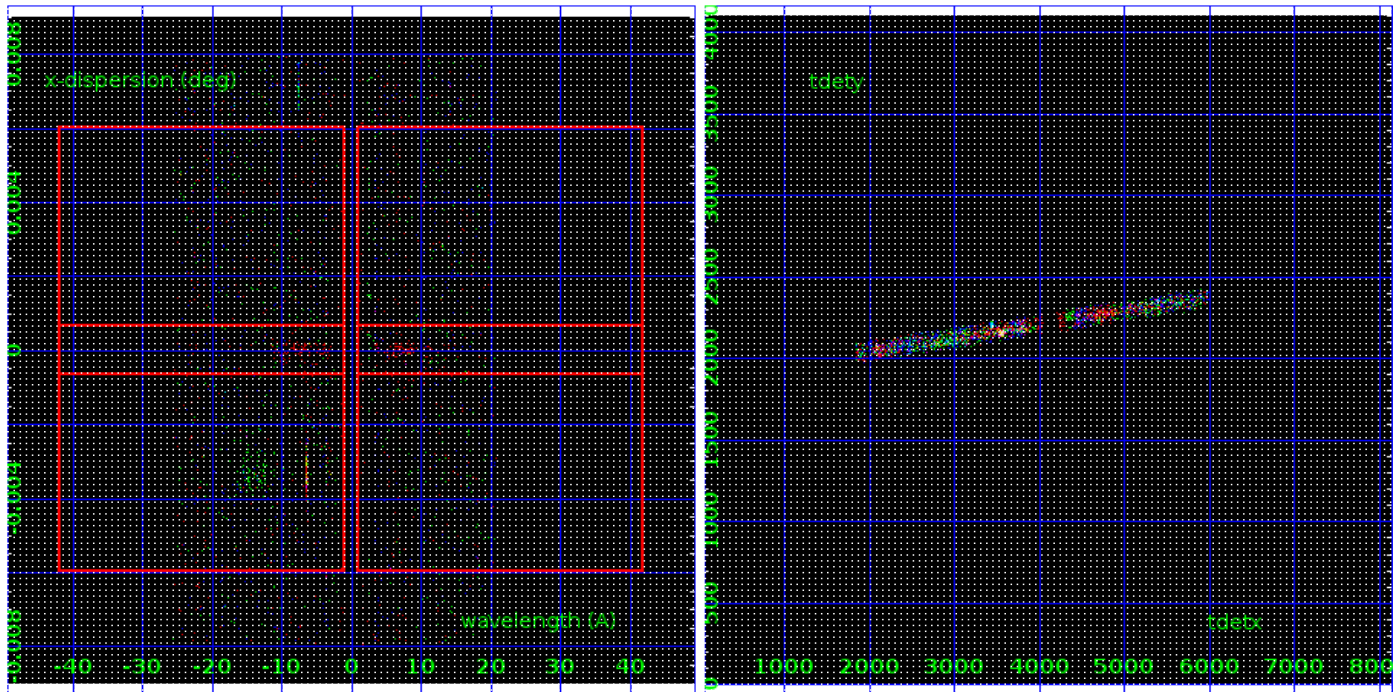
3.2 MEG Arm



MEG Order Sort 123

MEG Zero Order

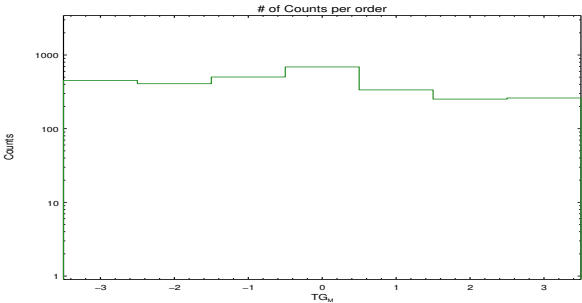
MEG Order Sort ALL

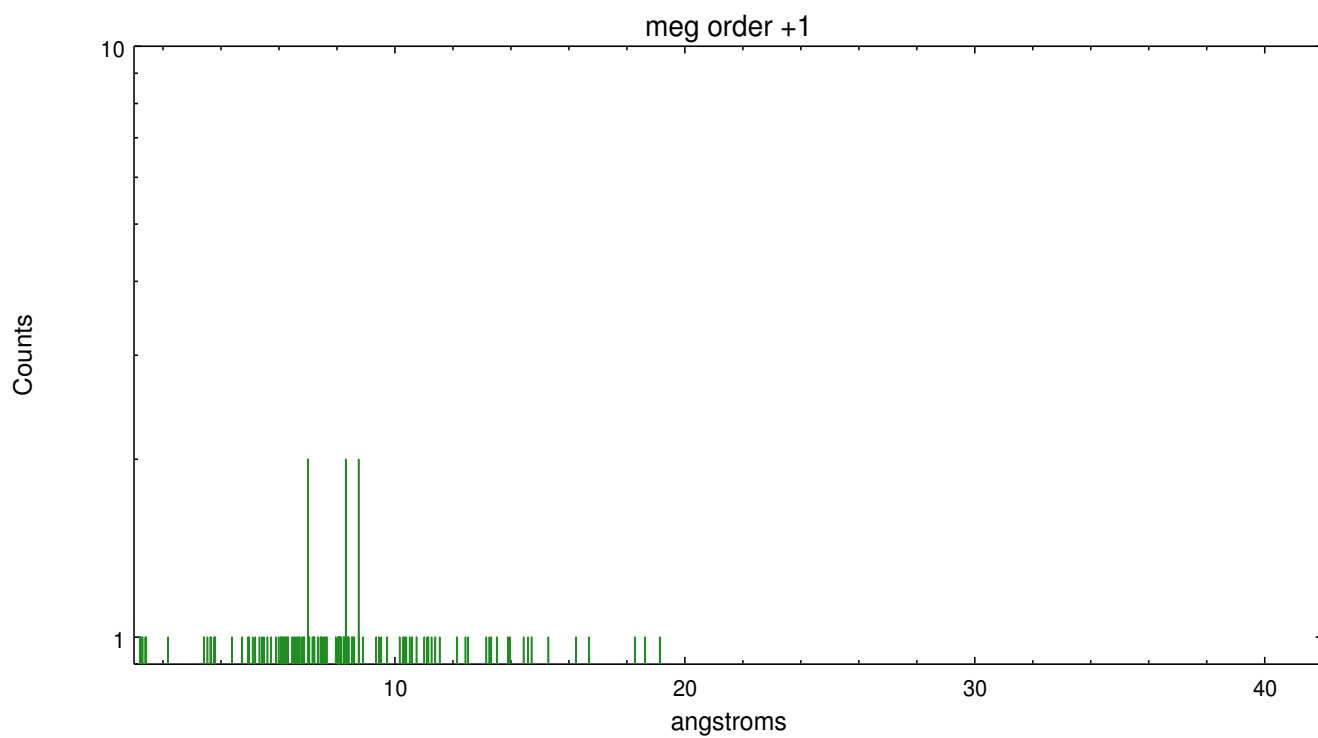
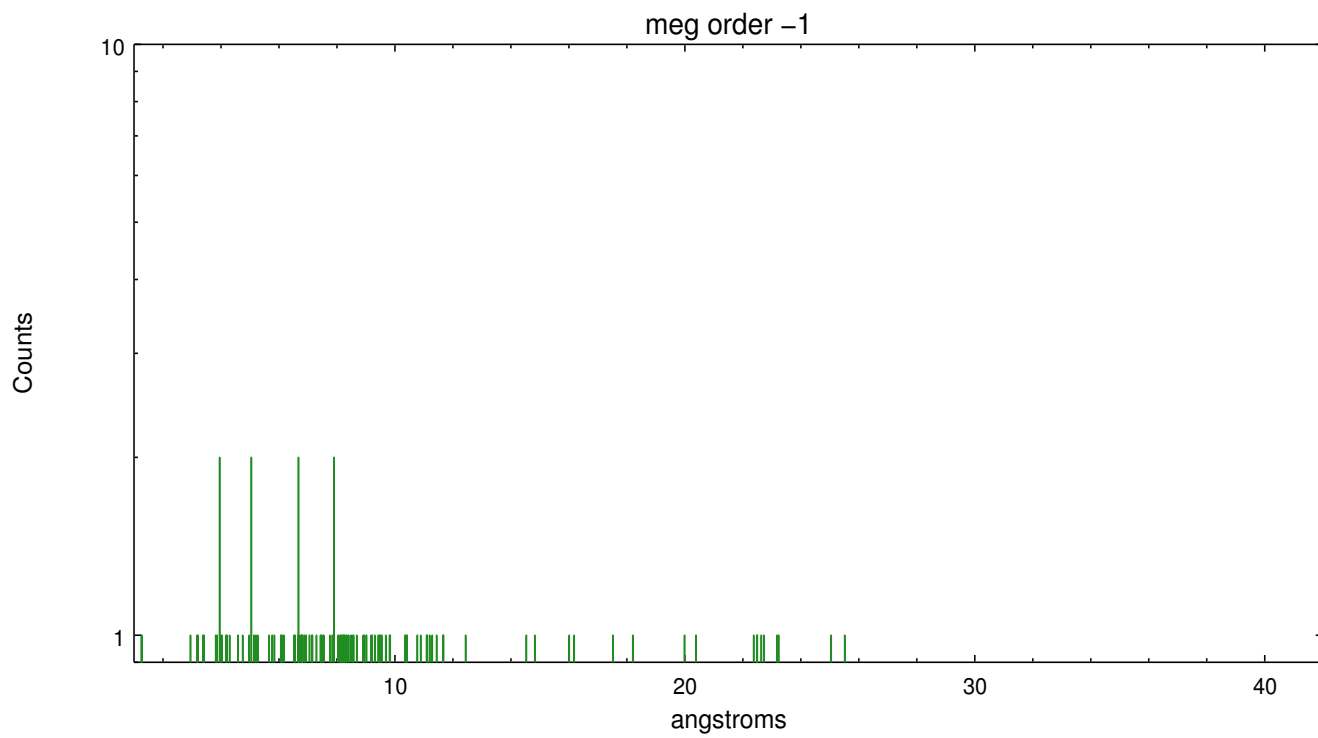


Spot Image MEG

Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	451	408	503	689	336	252	261





A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2019.05.21
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	44.020000338674

A.2 Comments

The target was too faint during this observation for the zeroth order position to be determined automatically by the software. The zeroth order position was determined by eye and manually input into the processing.

===

The focal plane temperature is warmer than -112.0 C during the interval 674425125.82 - 674439537.73 (MET s) of this observation. This temperature is the upper limit of the verified ACIS calibration for the back-illuminated chips. The focal plane temperature during part 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/ACIS_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.

===

Target optically monitored in slot 7. The ACA has the capability to devote one or more of the eight image slots to "monitor" particular sky locations. This allows simultaneous optical photometry of one or more

targets in the ACA field of view. These optical sources can be slightly fainter than the ACA guide star limit of $m_{ACA} = 10.2$ mag. The bright-end limit for monitor star photometry is $m_{ACA}=6.2$ mag. However, since there are a fixed number of image slots, devoting a slot to photometry instead of tracking a guide star results in a degradation of the image reconstruction and celestial location accuracy (Section 5.4). Using one monitor slot represents a 15 - 25% increase in the aspect image reconstruction RMS diameter, depending on the particular guide star configuration. Two monitor slots would increase the diameter by about 50 - 60%, but this configuration is not operationally allowed under normal circumstances. The photometric accuracy which can be achieved depends primarily on the star magnitude, integration time, CCD dark current, CCD read noise, sky background, and the CCD dark current uncertainty.