

V&V Reference Report

L2 ASCDS Version : 10.8.1

Observation 23000 - L2 Version 2
Chandra X-Ray Center

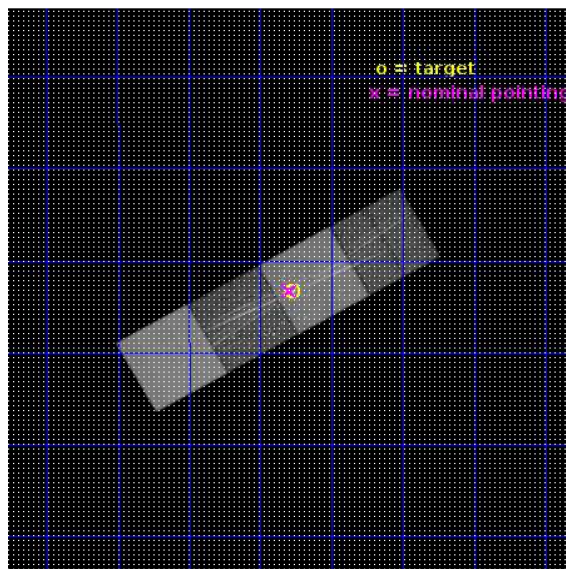
L2 Processing Date : Jan 3 2020

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1 Front

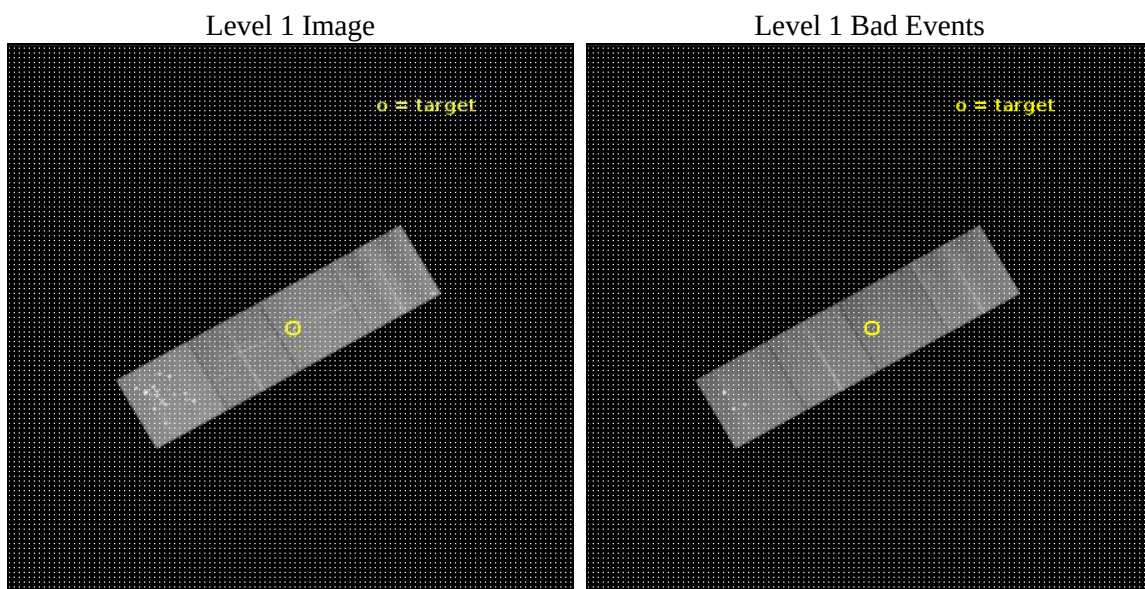
seq_num	201298	Sequence number
obs_id	23000	Observation id
title	THE TRUE NATURE OF X-RAYS FROM THE ORION TRAPEZIUM	Proposal title
observer	Norbert Schulz	Principal investigator
object	Orion Nebula Cluster	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	83.81875	Observer's specified target RA [deg]
dec_targ	-5.38975	Observer's specified target Dec [deg]
ra_nom	83.824241833283	Nominal RA [deg]
dec_nom	-5.3877021479204	Nominal Dec [deg]
roll_nom	330.38439368449	Nominal Roll [deg]
revision	2	Processing version of data
ontime	43065.179882765	Sum of GTIs [s]
livetime	42502.501603472	Livetime [s]
ontime5	43065.138842821	Sum of GTIs [s]
ontime6	43065.097802758	Sum of GTIs [s]
ontime7	43065.179882765	Sum of GTIs [s]
ontime8	43065.056762815	Sum of GTIs [s]
l2events	601479	Number of level 2 events



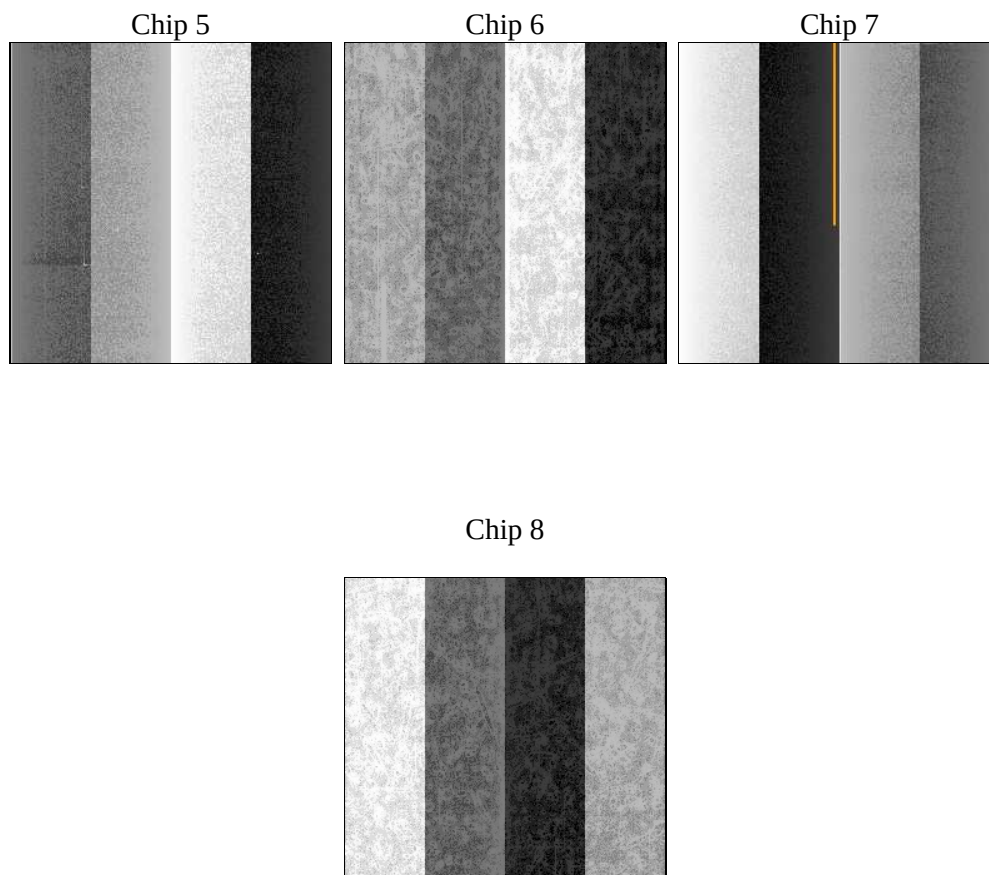
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	43000.000000	[s] Scheduled observation exposure time
ascdsver	10.8.1	Processing system revision	ontime	43065.179882765	Sum of GTIs [s]
caldsver	4.8.4.2	 	ontime5	43065.138842821	Sum of GTIs [s]
date	2020-01-03T19:56:30	Date and time of file creation	ontime6	43065.097802758	Sum of GTIs [s]
revision	2	Processing version of data	ontime7	43065.179882765	Sum of GTIs [s]
			ontime8	43065.056762815	Sum of GTIs [s]
			l1events	2004450	Number of level 1 events
			tgmethod	TGDETECT	Method used to create src1a file
			zo_pos	(4138.23, 4081.43)	src1a sky pixel position

2.1.4 Events

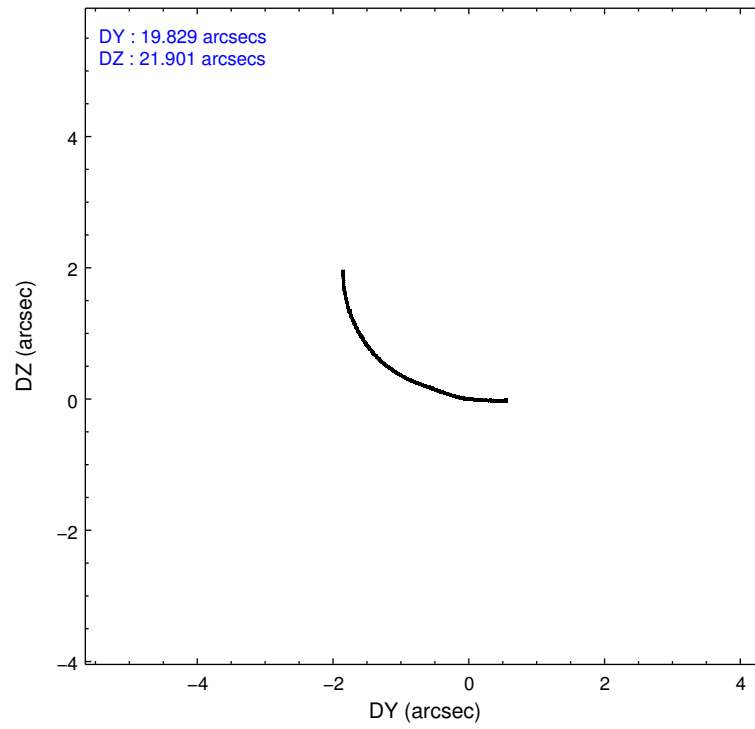
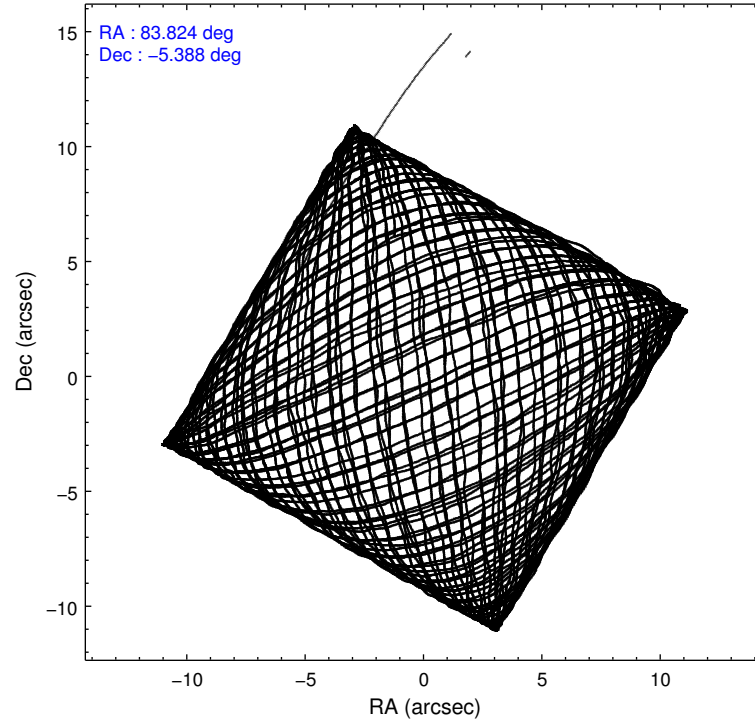
	ccd 5	ccd 6	ccd 7	ccd 8
level 1 events	673463	377827	498426	454734
rejected events	308257	309696	249716	325127
rejected %	45%	81%	50%	71%

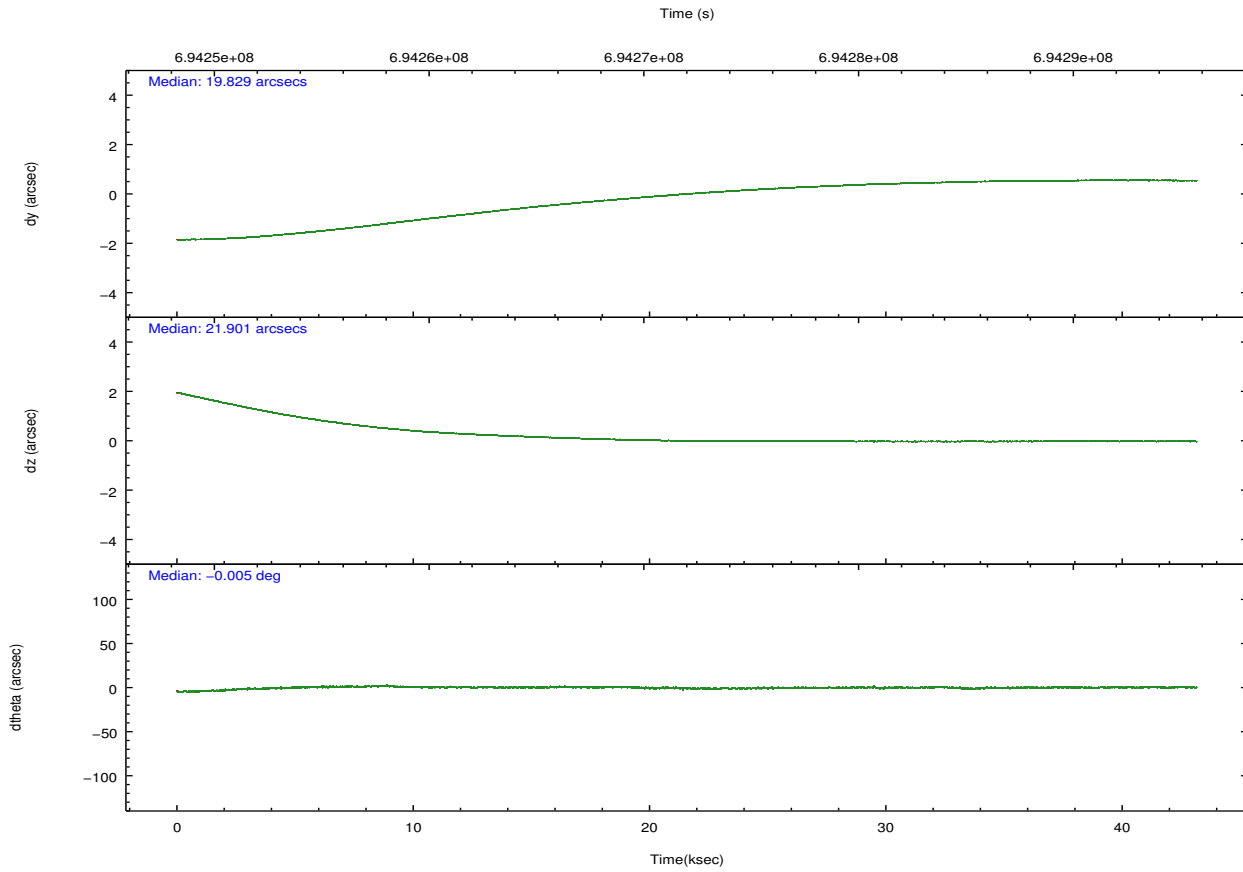
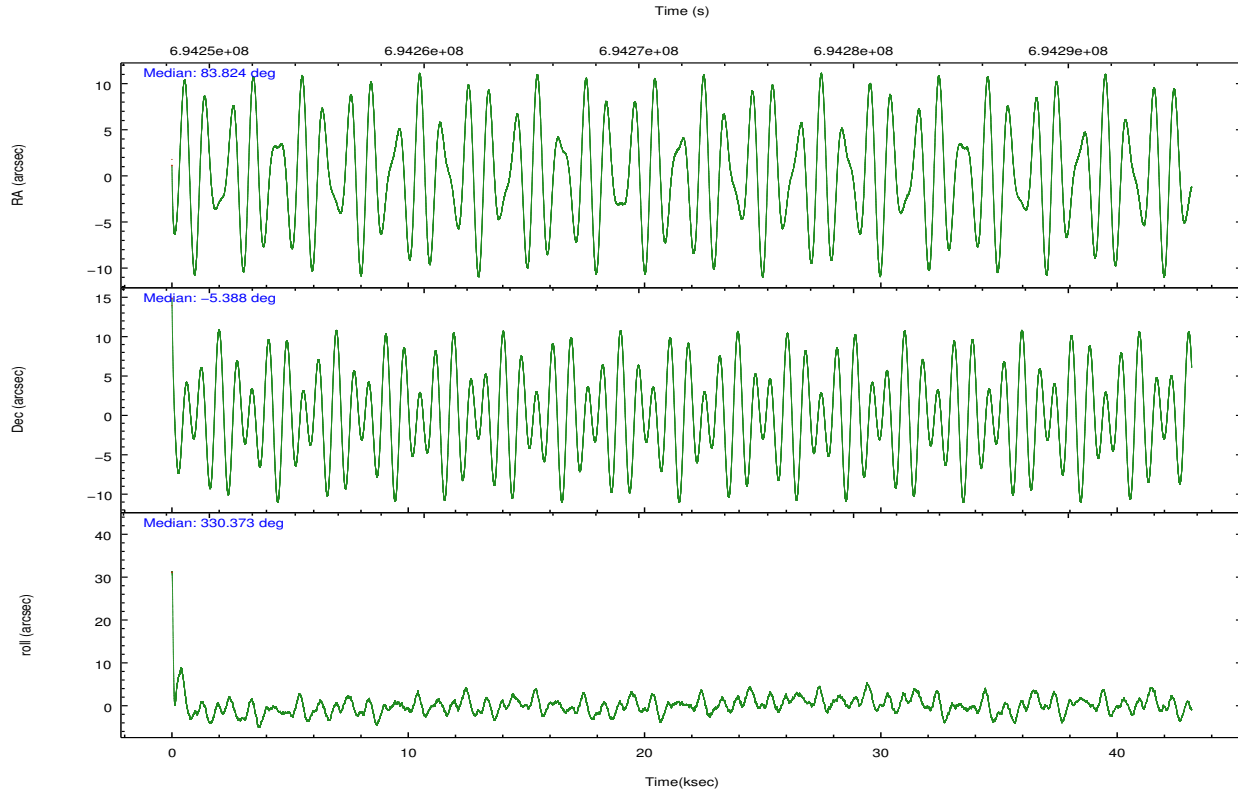
	ccd 5	ccd 6	ccd 7	ccd 8
grade 0 events	105199	33926	28851	40612
	15%	8%	5%	8%
grade 1 events	1570	245	906	394
	0%	0%	0%	0%
grade 2 events	97641	14505	55458	29328
	14%	3%	11%	6%
grade 3 events	9469	4299	20751	13085
	1%	1%	4%	2%
grade 4 events	7560	4324	20526	14919
	1%	1%	4%	3%
grade 5 events	38272	14680	42384	23181
	5%	3%	8%	5%
grade 6 events	145419	11090	123158	31687
	21%	2%	24%	6%
grade 7 events	268333	294758	206392	301528
	39%	78%	41%	66%

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	83.796682	83.82424183328305	CCD I2 on	N	N
[deg] Pointing Dec	-5.388253	-5.387702147920444	CCD I3 on	N	N
[deg] Pointing Roll	330.225163	330.3843936844949	CCD S0 on	O1	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)	694250564.184000	694249532.7946	CCD S5 on	O2	N
Observation start date	2020-01-01T07:21:35	2020-01-01T07:05:32	Number of optional ACIS chips dropped	2	2
[s] Observation end time (MET)	694293564.184000	694294353.99731	On-chip summing requested	N	N
Observation end date	2020-01-01T19:18:15	2020-01-01T19:32:33	Subarray requested	NONE	NONE
Read mode	TIMED	TIMED	Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	3.1

2.3 Aspect



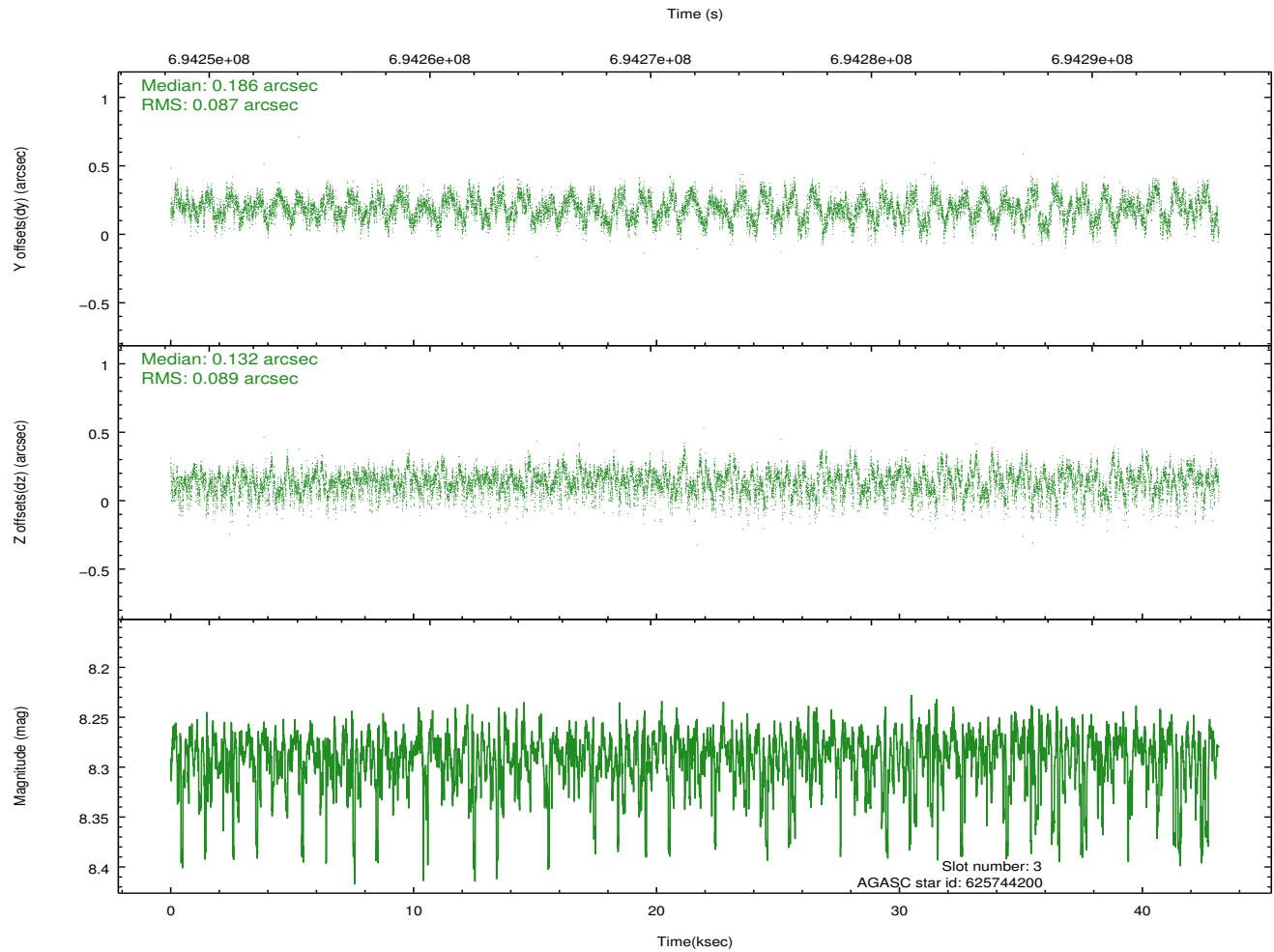
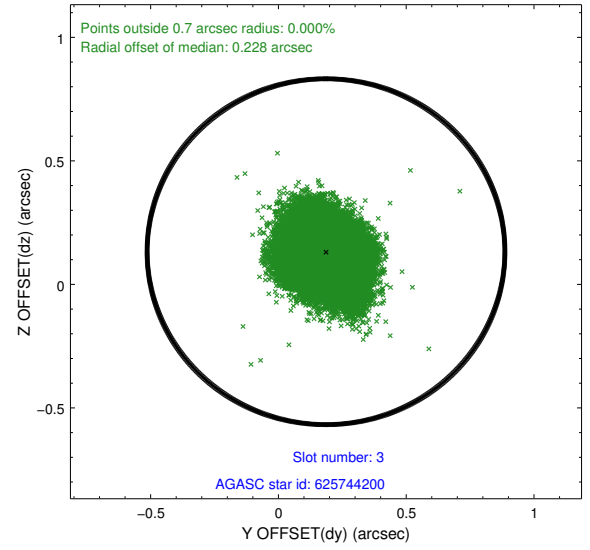
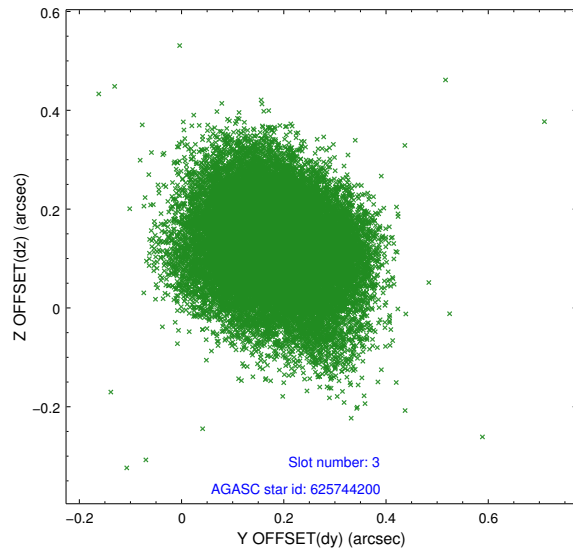


Slot Statistics

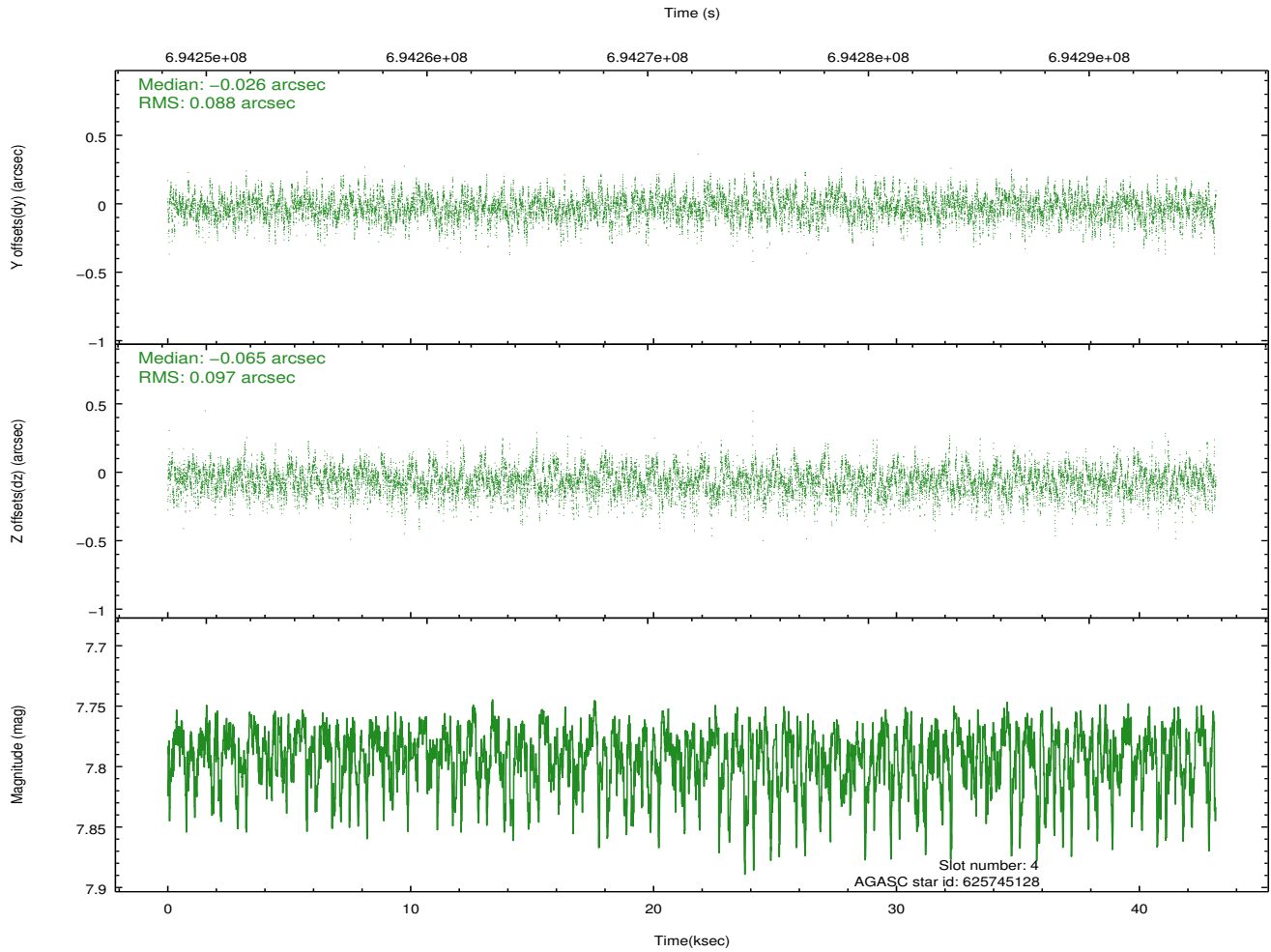
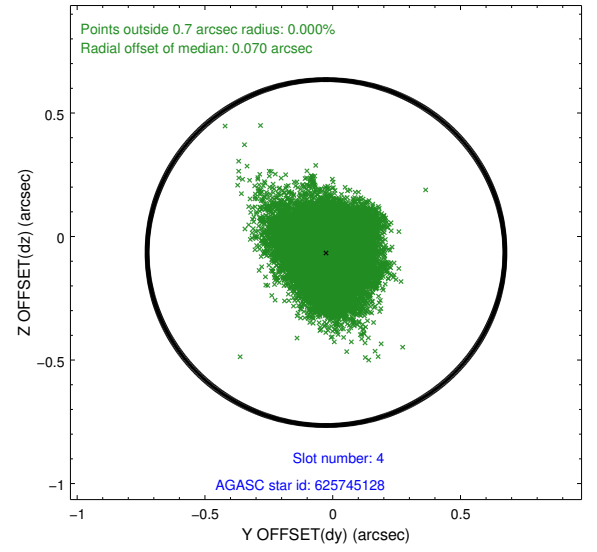
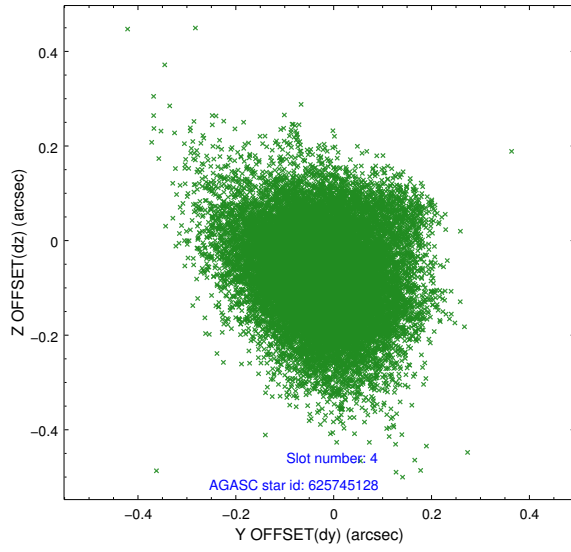
pt	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mea
0	FID		ACIS-S-3	7.33	10526	1.000	-0.215	-0.246	0.031	0.056	0.000000	0.000000	40.38	-1873
1	FID		ACIS-S-4	7.22	10523	1.000	0.750	0.231	0.024	0.047	0.000000	0.000000	2141.47	164
2	FID		ACIS-S-5	7.18	10525	1.000	-0.564	0.027	0.014	0.046	0.000000	0.000000	-1826.03	158
3	GUIDE	used	625744200	8.29	21040	1.000	0.186	0.132	0.135	0.208	83.695760	-5.570729	13.22	-749
4	GUIDE	used	625745128	7.79	21046	1.000	-0.026	-0.065	0.138	0.228	83.769930	-4.731835	-1256.77	2003
5	GUIDE	used	625745136	7.20	21050	1.000	-0.131	0.119	0.113	0.187	83.600341	-4.804339	-1655.06	1475
6	GUIDE	used	626272880	7.68	21040	1.000	-0.025	-0.091	0.120	0.203	83.815609	-6.032748	1211.85	-1979
7	GUIDE	used	626272976	7.95	21037	1.000	-0.002	-0.092	0.109	0.191	83.795875	-5.926912	961.40	-1684

2.4 Star Slots

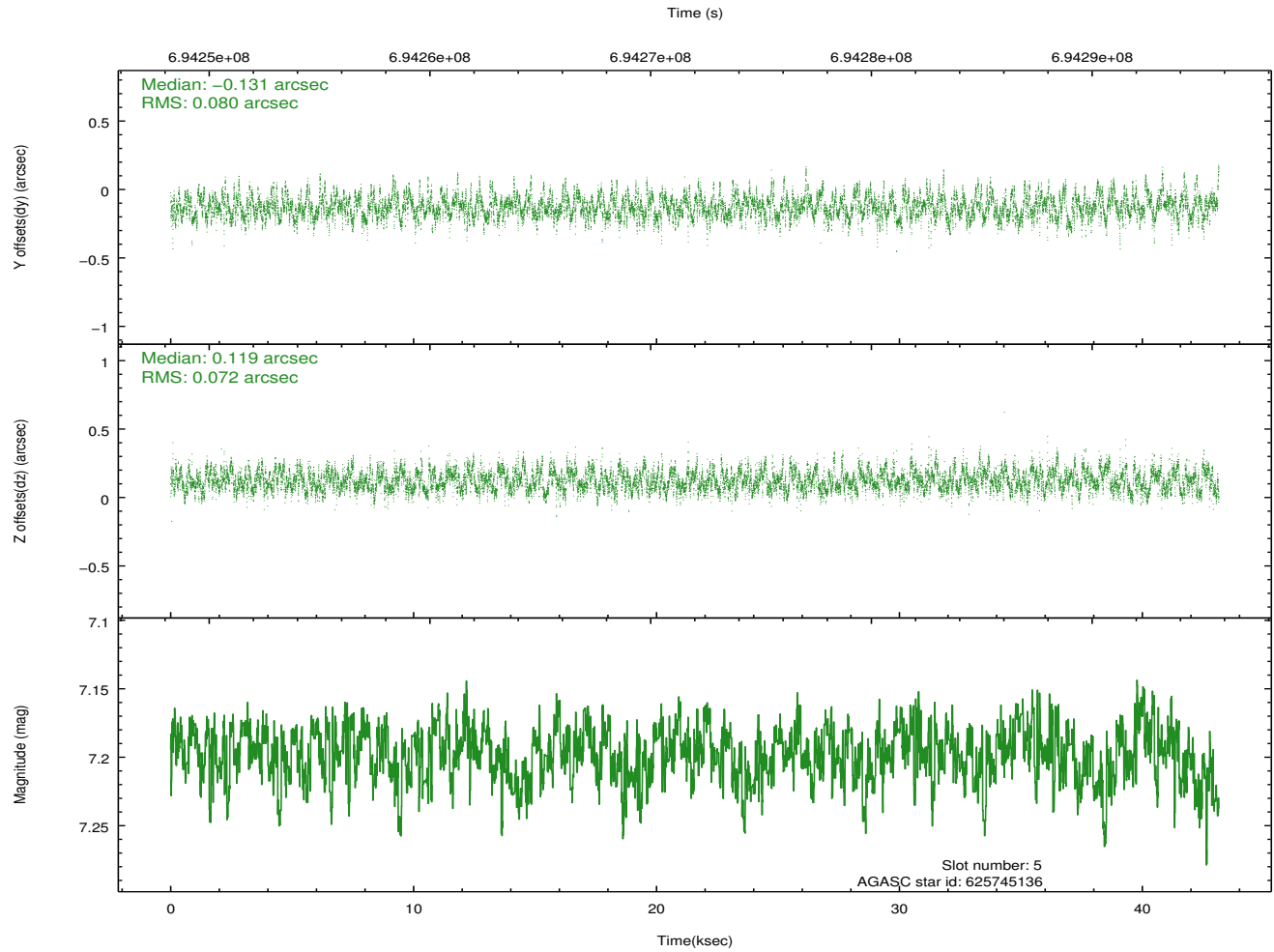
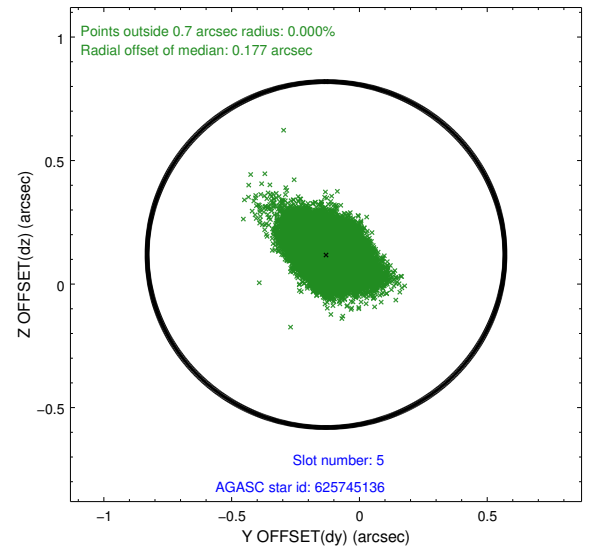
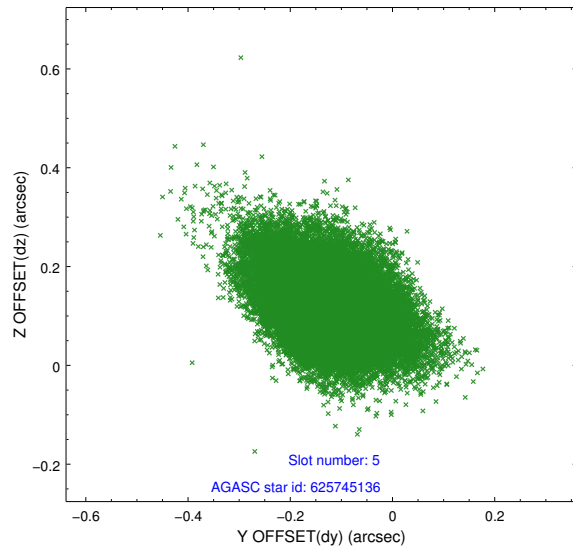
2.4.1 Slot 3



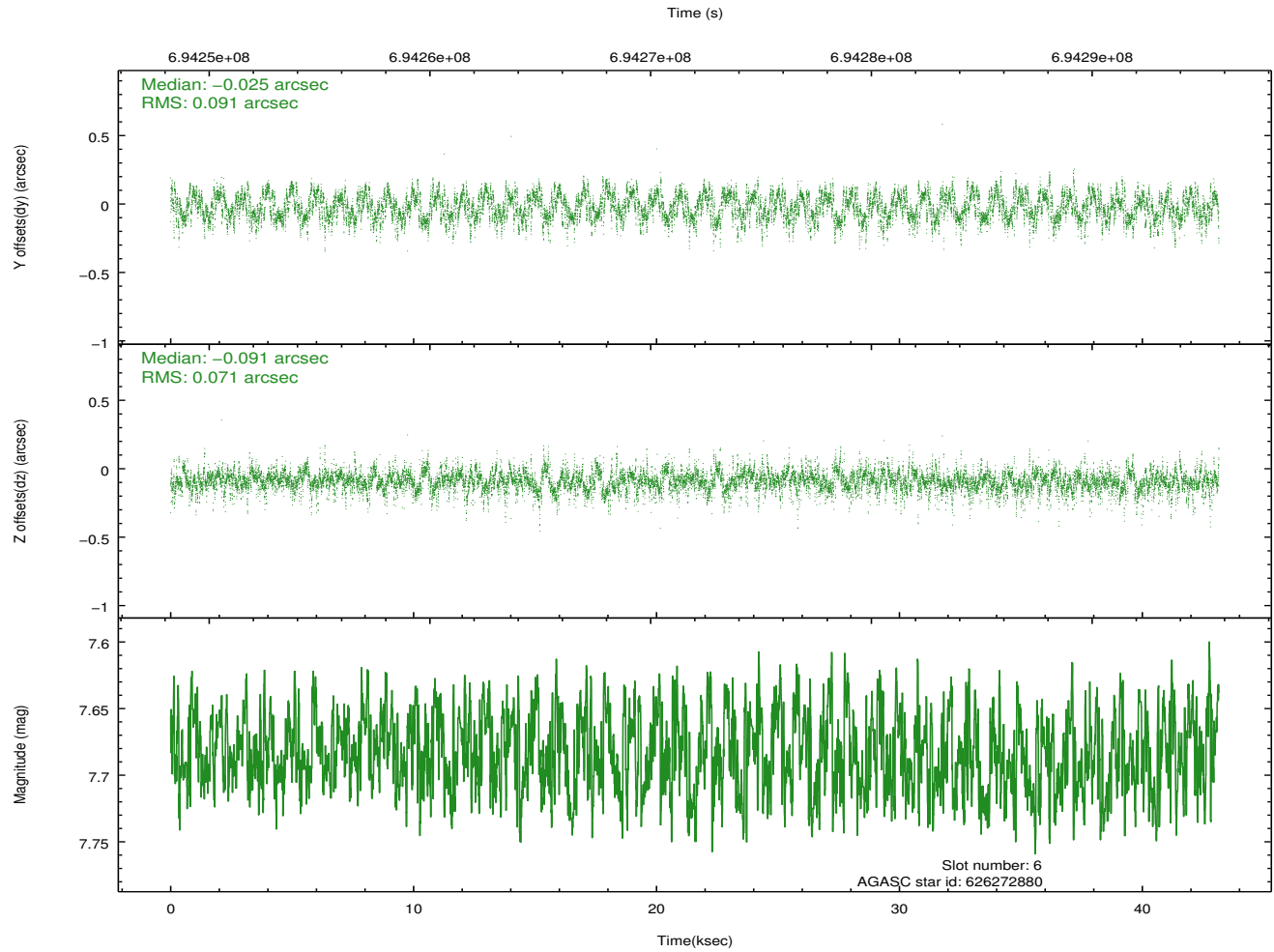
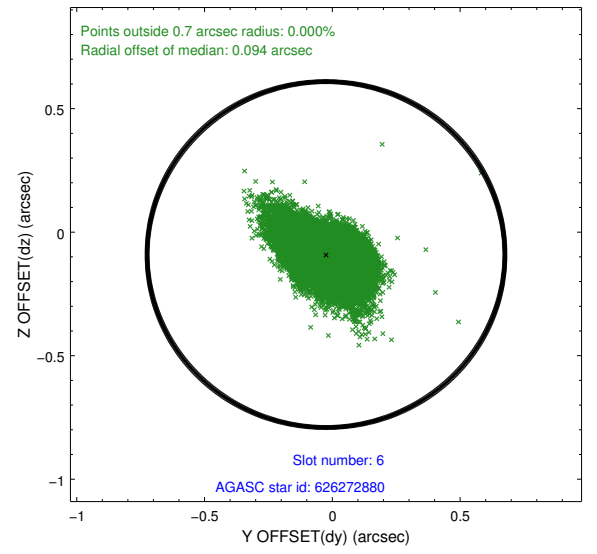
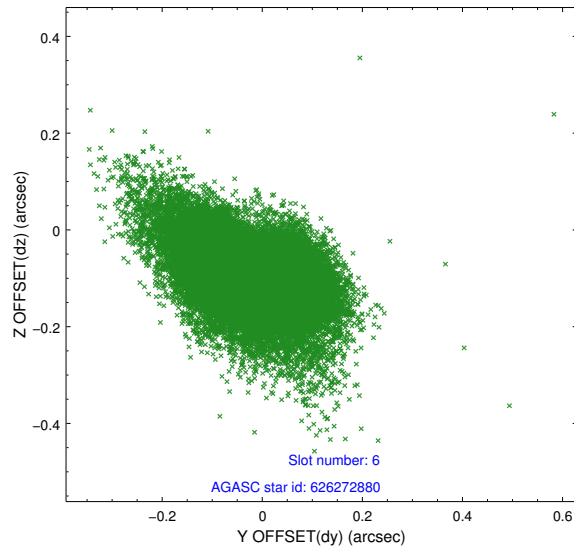
2.4.2 Slot 4



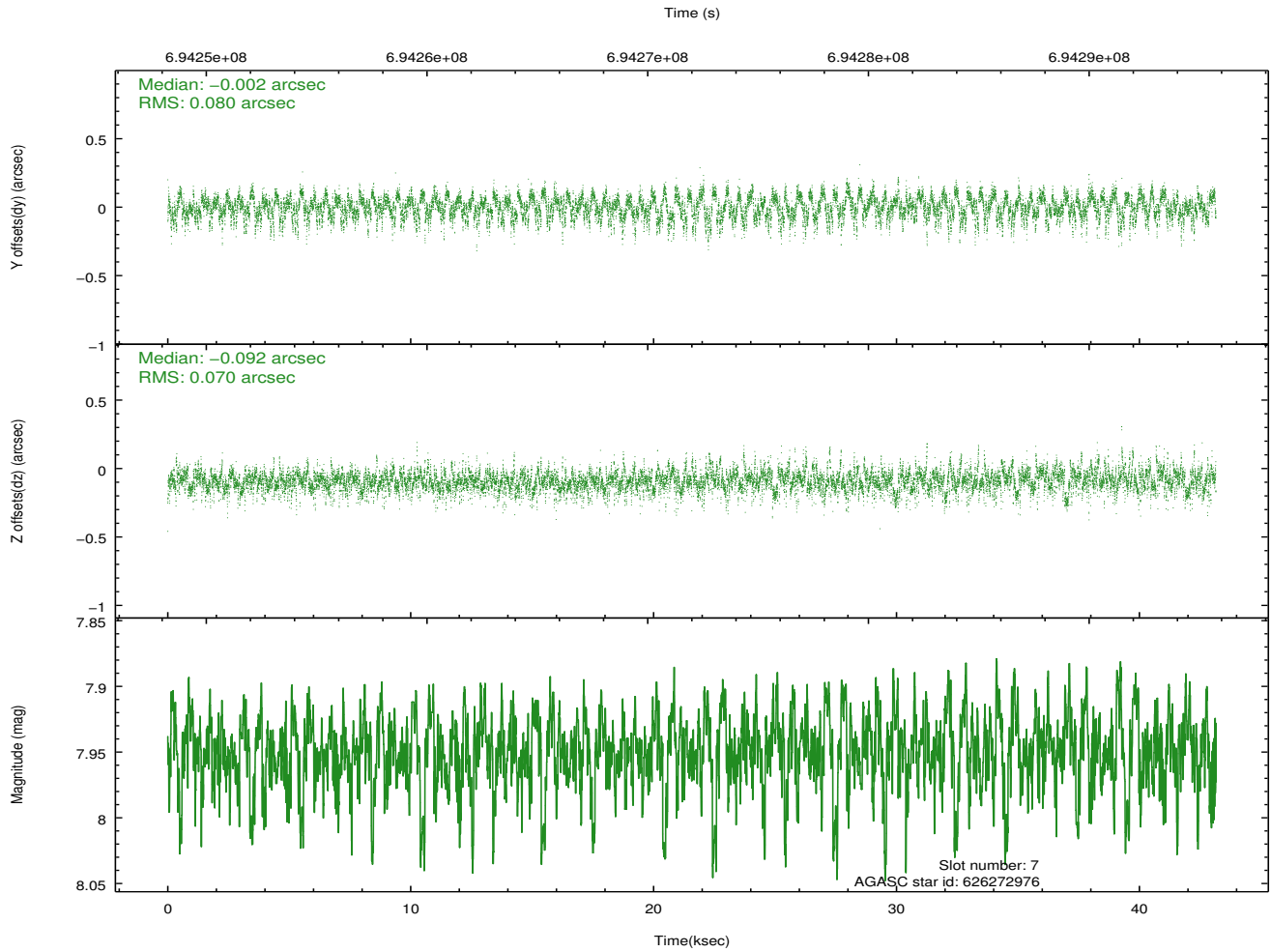
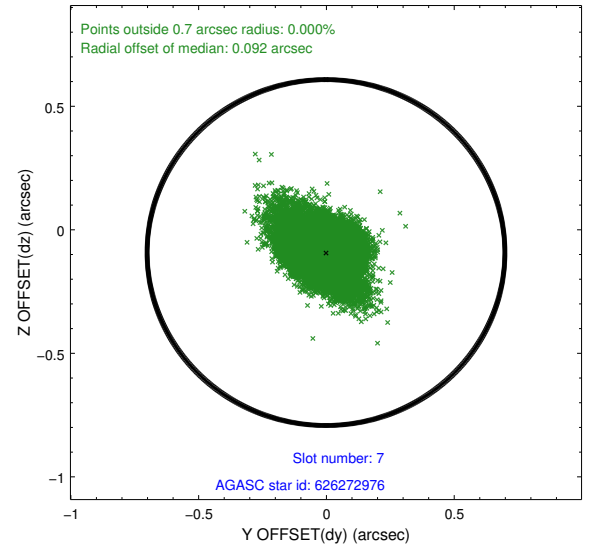
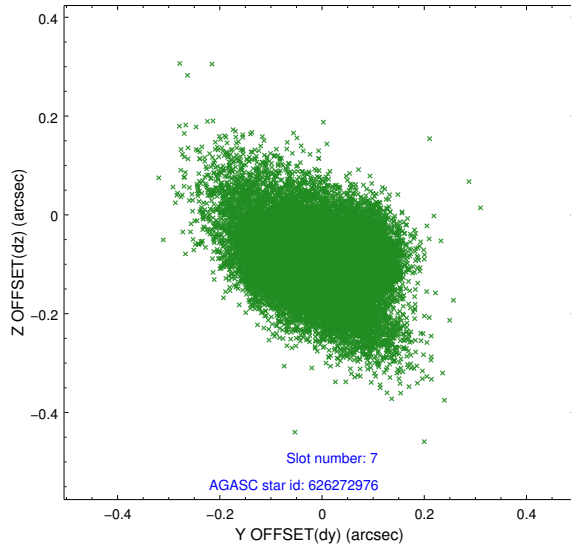
2.4.3 Slot 5



2.4.4 Slot 6

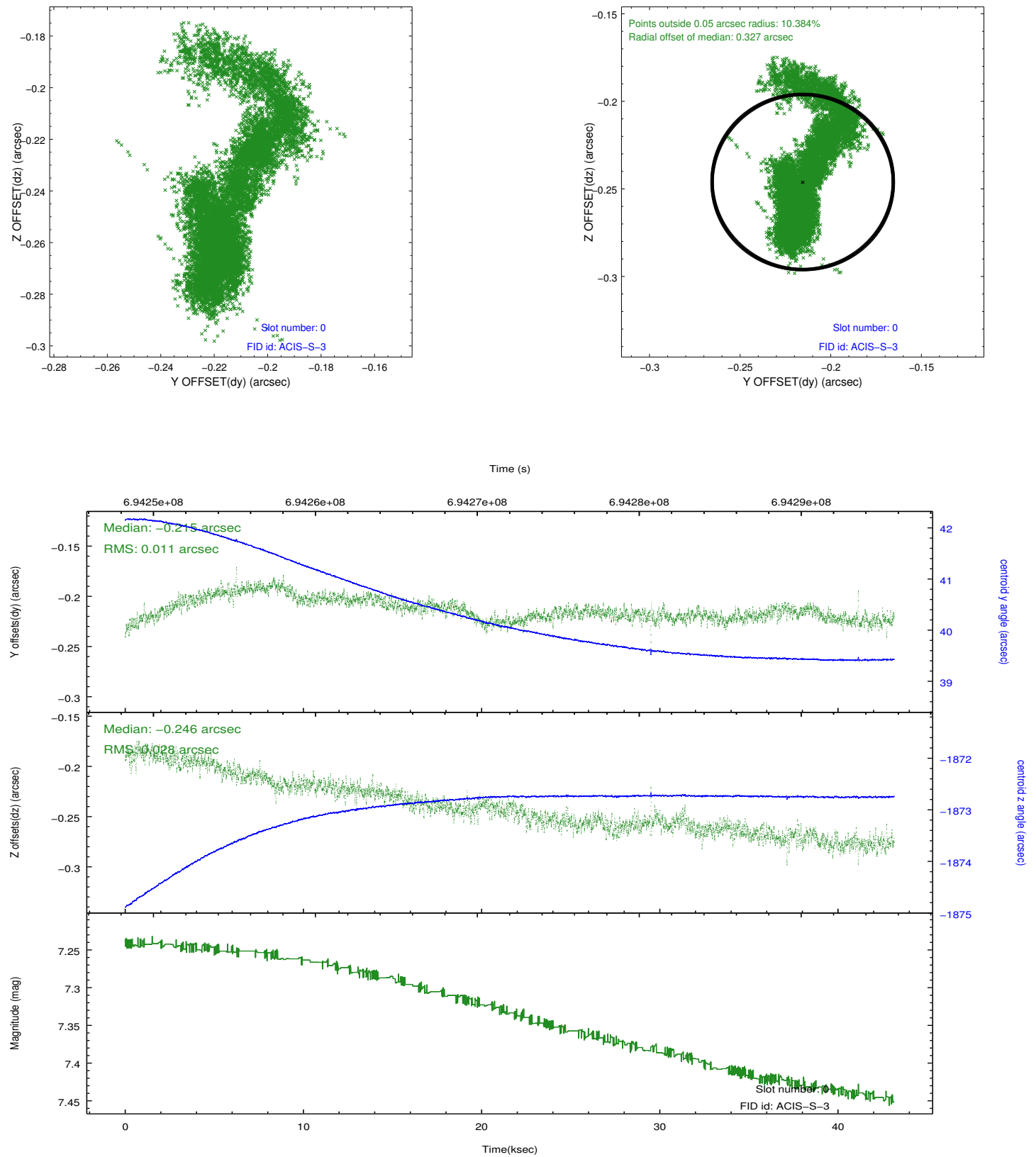


2.4.5 Slot 7

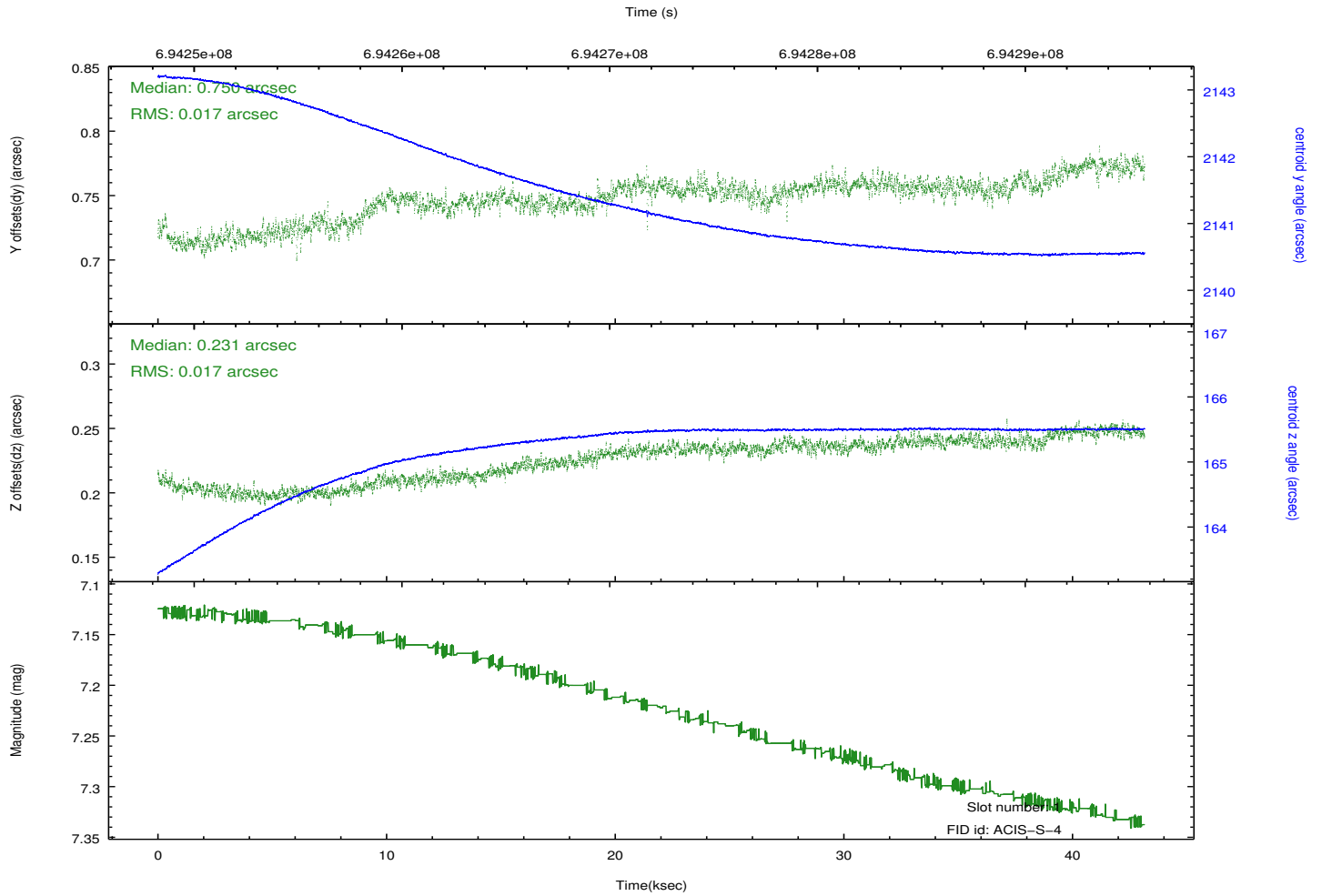
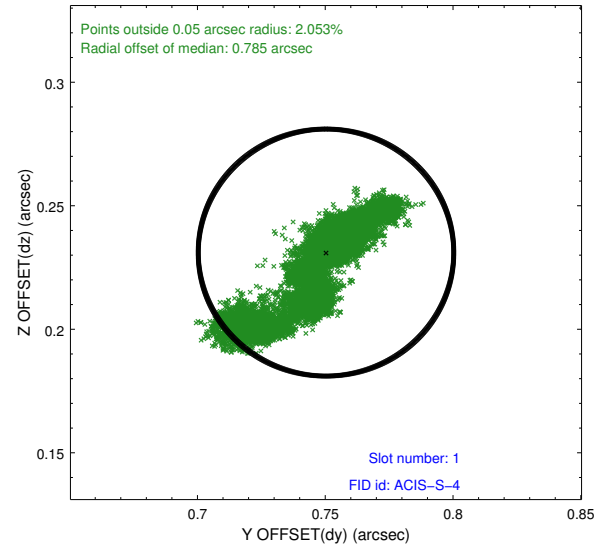
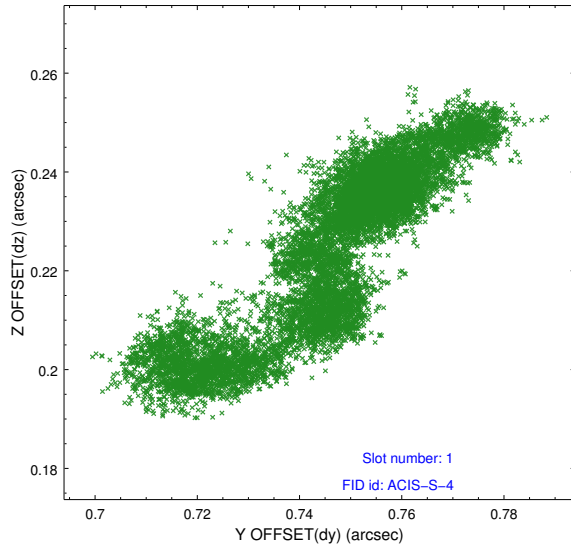


2.5 FID Slots

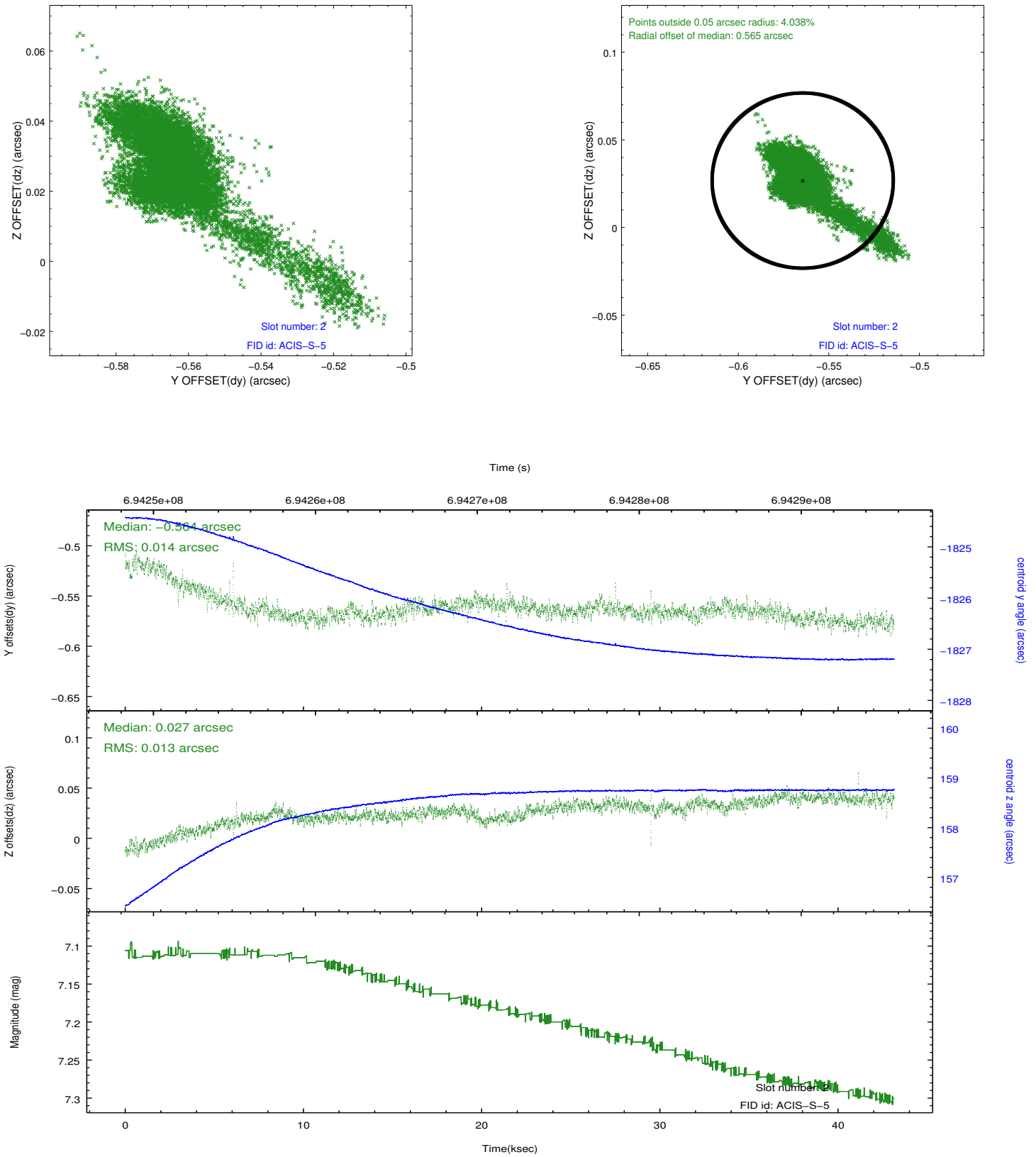
2.5.1 Slot 0



2.5.2 Slot 1

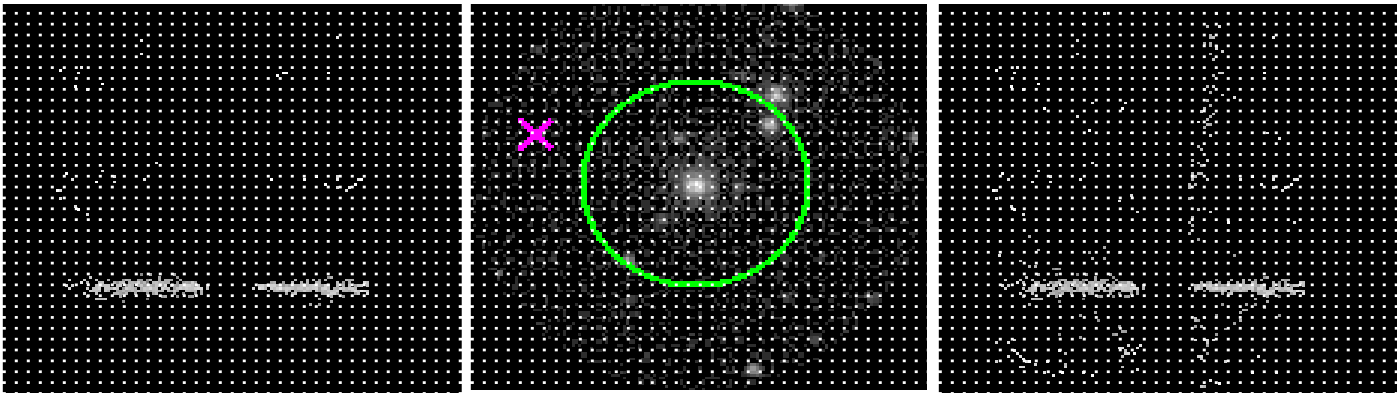


2.5.3 Slot 2



3 Gratings

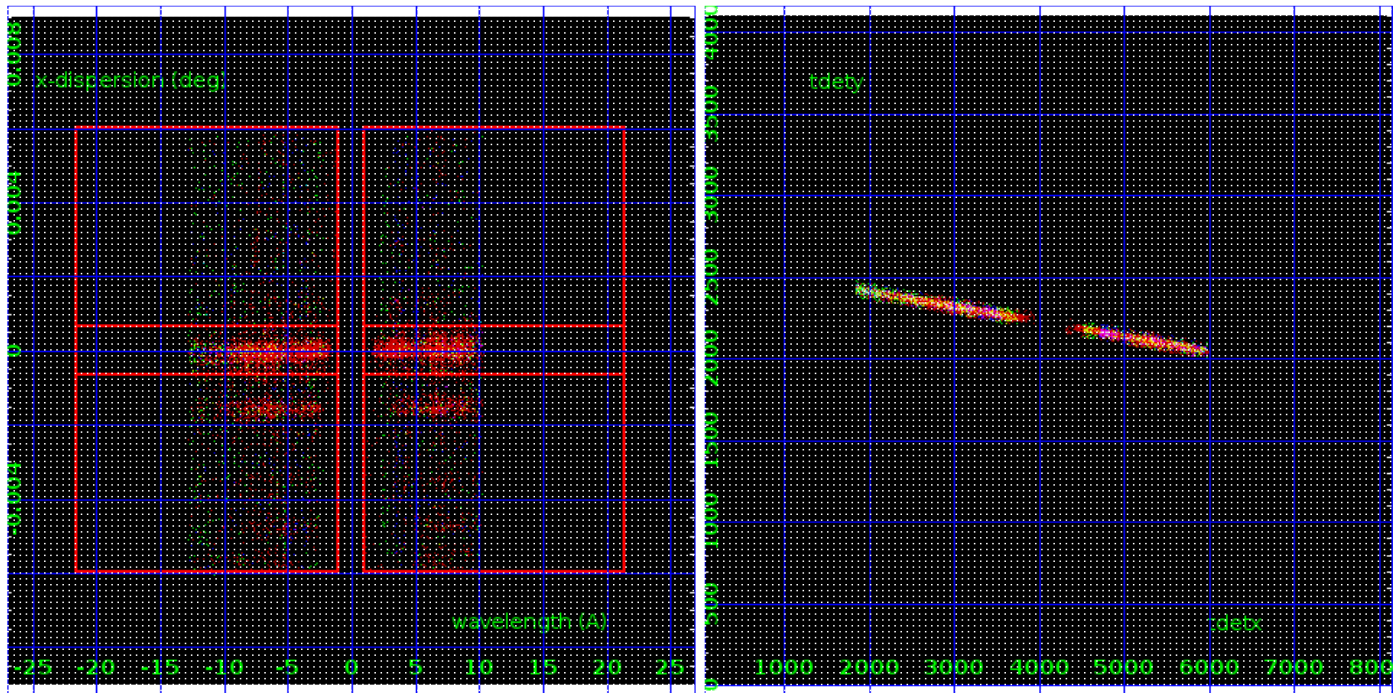
3.1 HEG Arm



HEG Order Sort 123

HEG Zero Order

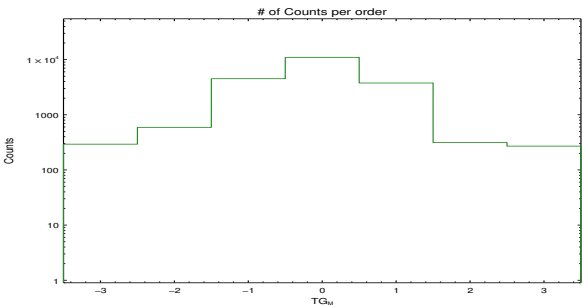
HEG Order Sort ALL

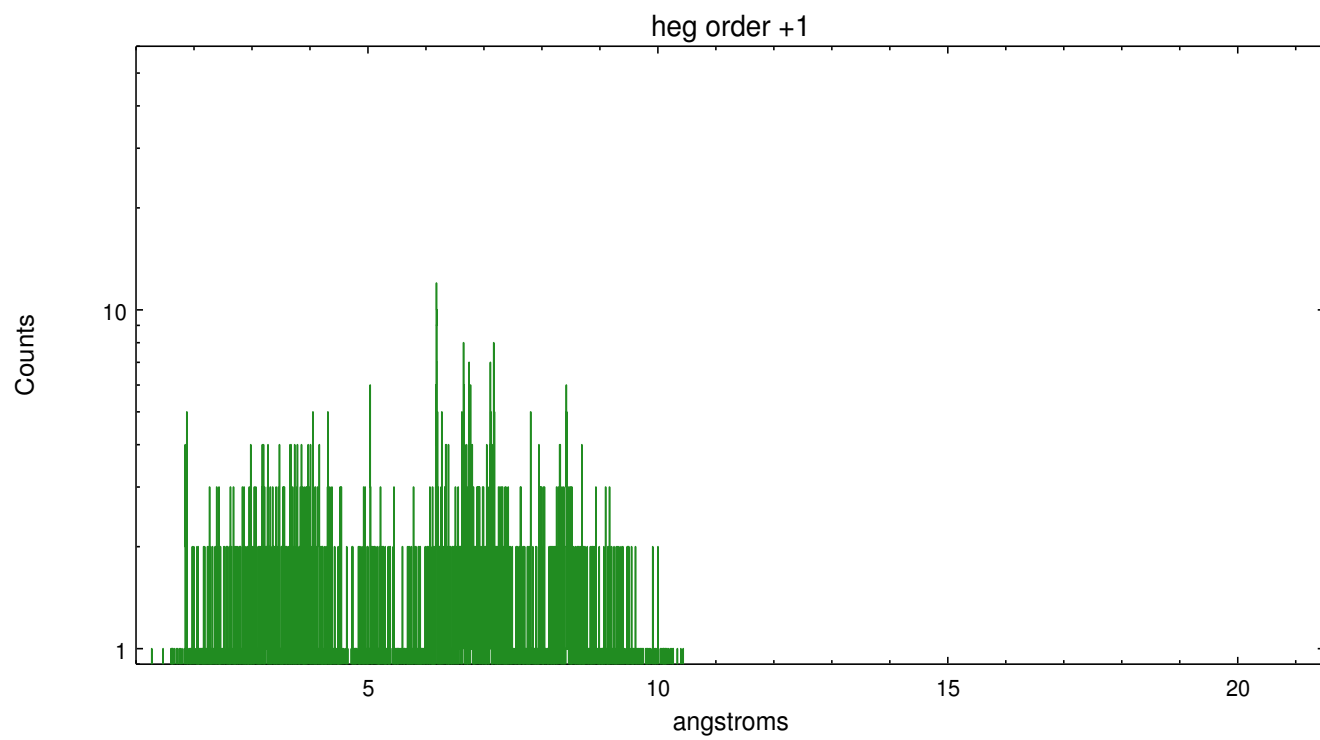
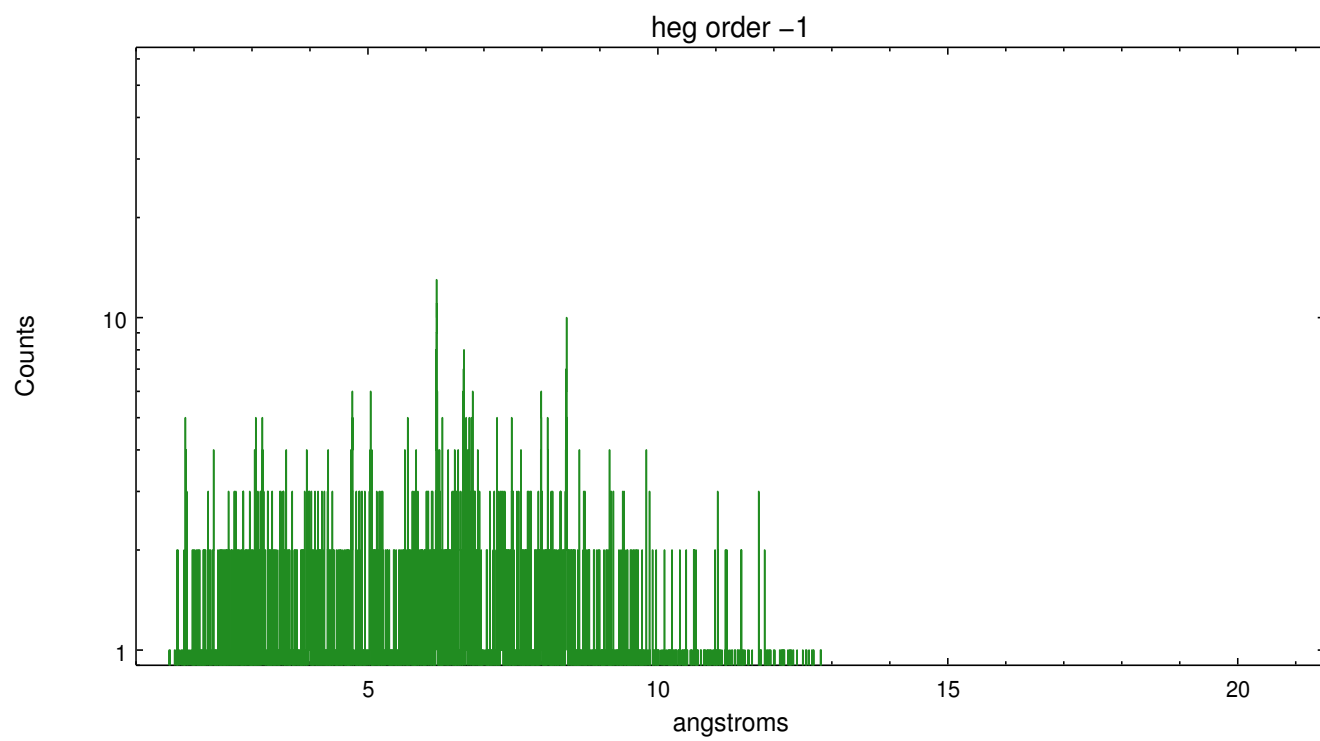


Spot Image HEG

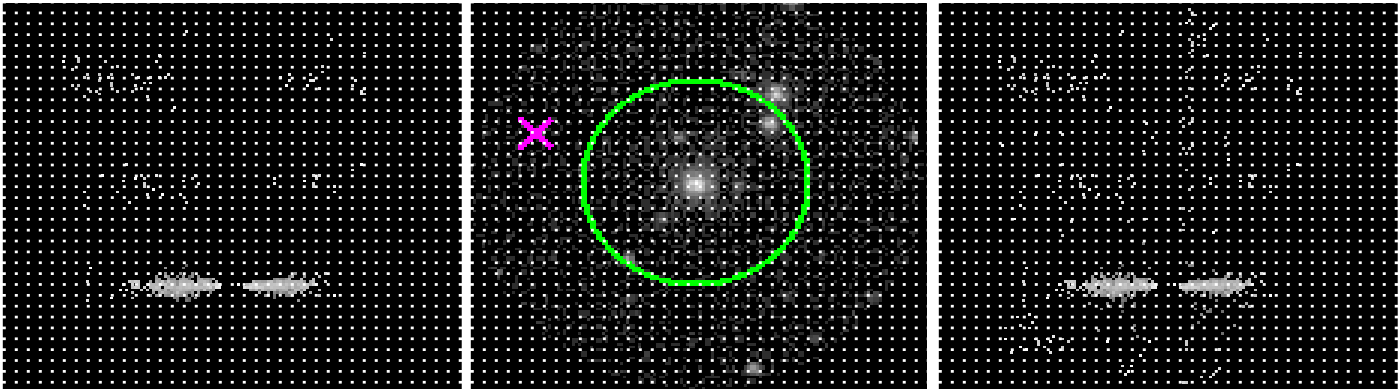
Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	293	591	4507	10989	3766	313	270





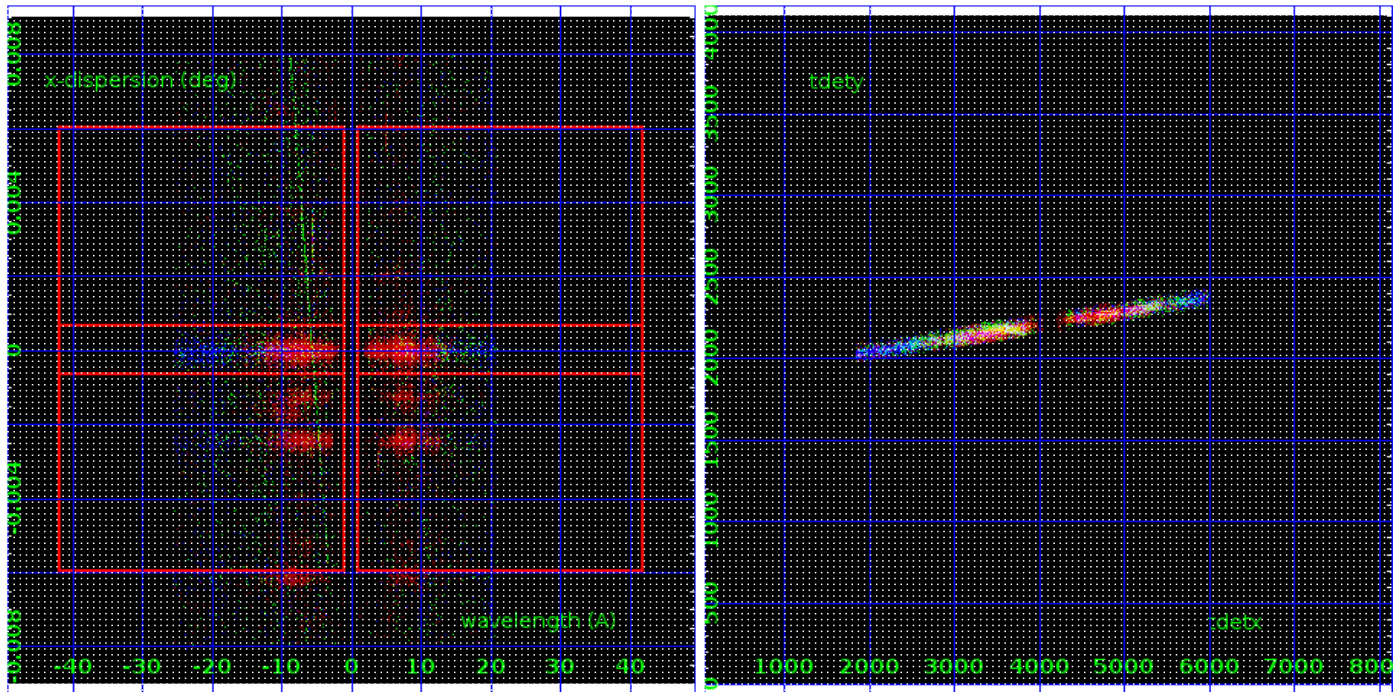
3.2 MEG Arm



MEG Order Sort 123

MEG Zero Order

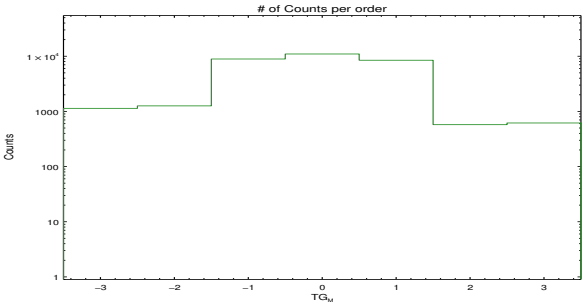
MEG Order Sort ALL

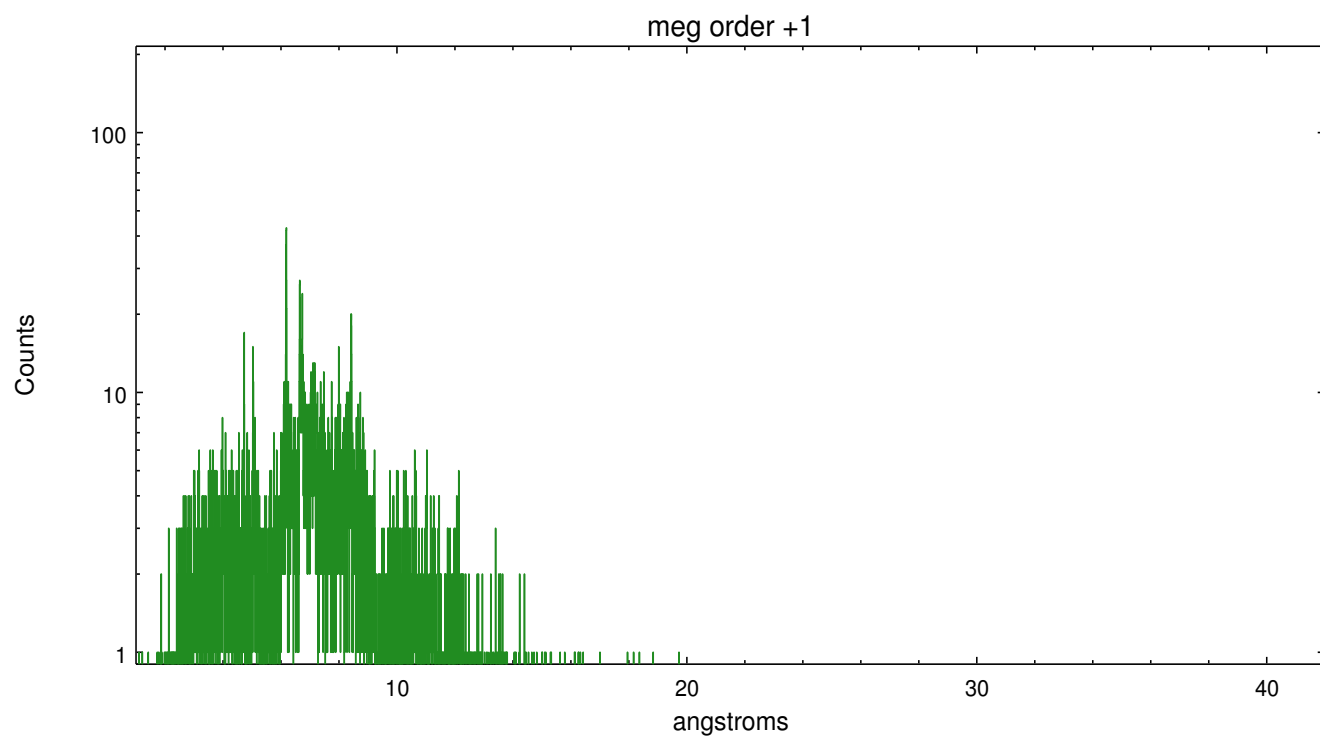
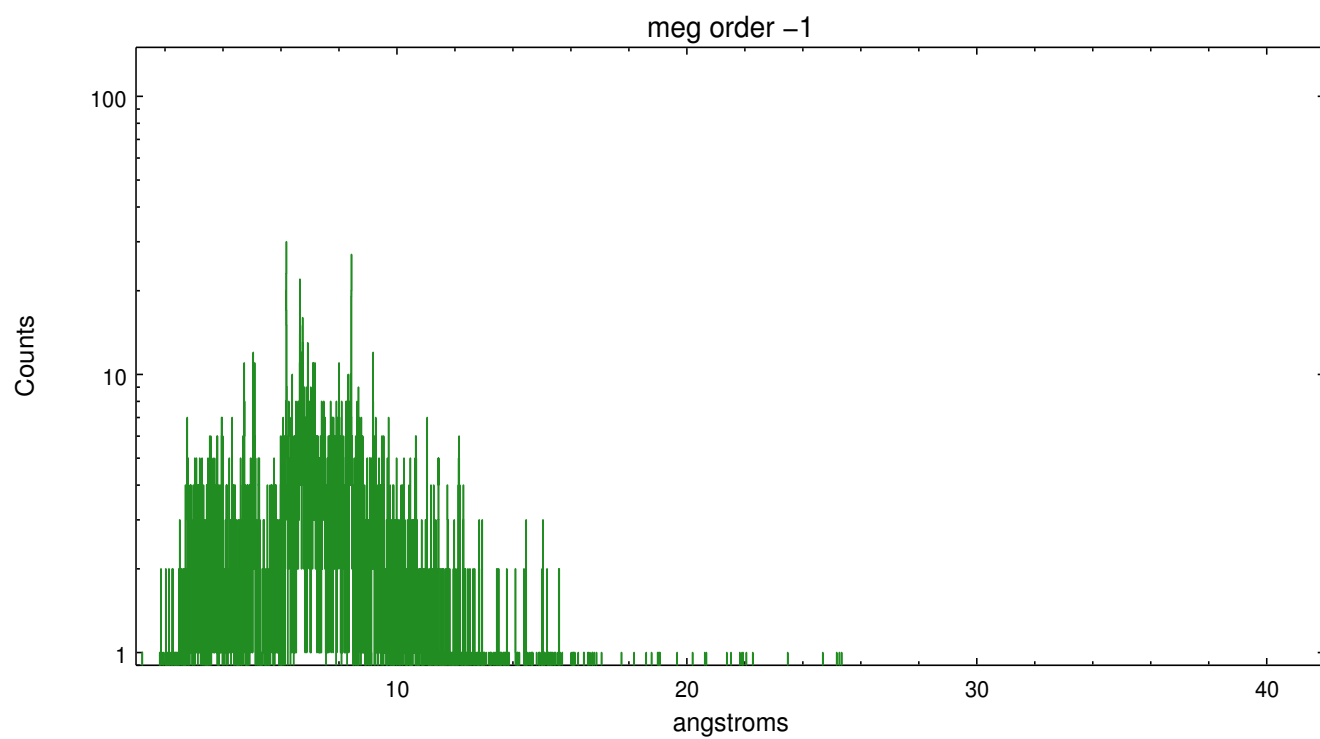


Spot Image MEG

Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	1136	1260	8914	10989	8462	575	617





A Summary

A.1 Status

V&V Scientist	Melania Nynka
V&V Date (YYYY-MM-DD)	2020.01.06
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	43.065179882765

A.2 Comments

To compensate for a few bad pixels not marked as bad that were not removed in the Level 2 processing, a custom bad pixel file with additional bad pixels at (chipx, chipy) = (232:234,322:339) in S1 was added in this processing. As a result, the user will NOT find a relatively bright square of pixels on the S1 chip for level 2 data caused by the application of the dither algorithm to the bad pixels in question, as opposed to previous processing(s).

=====

The focal plane temperature during the interval 694292258.54 - 694293557.44 (MET s) of this observation was warmer than the upper limit for optimum calibration of the ACIS gain and spectral resolution (i.e., -111.0 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.

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