

V&V Reference Report

L2 ASCDS Version : 10.8.1

Observation 22336 - L2 Version 1
Chandra X-Ray Center

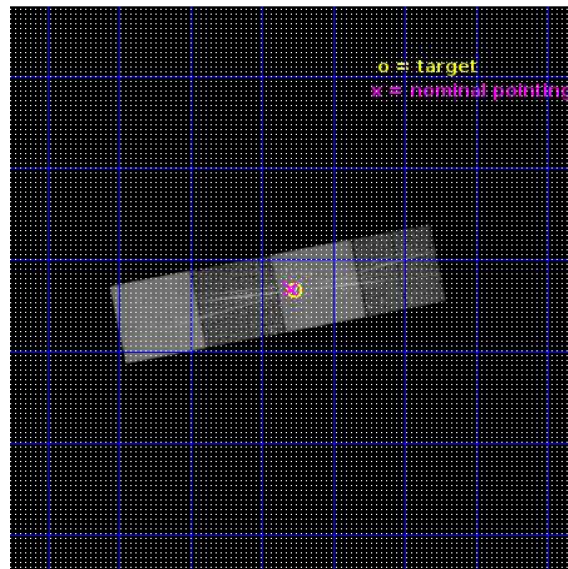
L2 Processing Date : Dec 22 2019

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1 Front

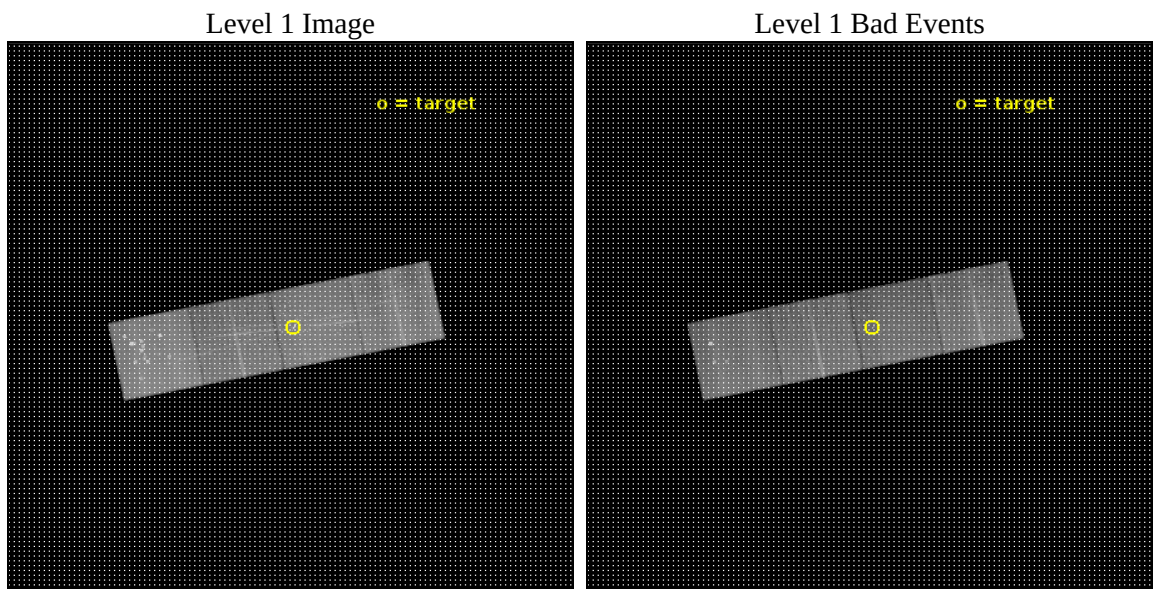
seq_num	201298	Sequence number
obs_id	22336	Observation id
title	THE TRUE NATURE OF X-RAYS FROM THE ORION TRAPEZIUM	Proposal title
observer	Norbert Schulz	Principal investigator
object	Orion Nebula Cluster	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	83.81875	Observer's specified target RA [deg]
dec_targ	-5.38975	Observer's specified target Dec [deg]
ra_nom	83.823639524827	Nominal RA [deg]
dec_nom	-5.3860282348164	Nominal Dec [deg]
roll_nom	348.53963361969	Nominal Roll [deg]
revision	1	Processing version of data
ontime	25930.181418538	Sum of GTIs [s]
livetime	25591.384508783	Livetime [s]
ontime5	25930.140378594	Sum of GTIs [s]
ontime6	25930.099338531	Sum of GTIs [s]
ontime7	25930.181418538	Sum of GTIs [s]
ontime8	25930.058298588	Sum of GTIs [s]
l2events	372421	Number of level 2 events



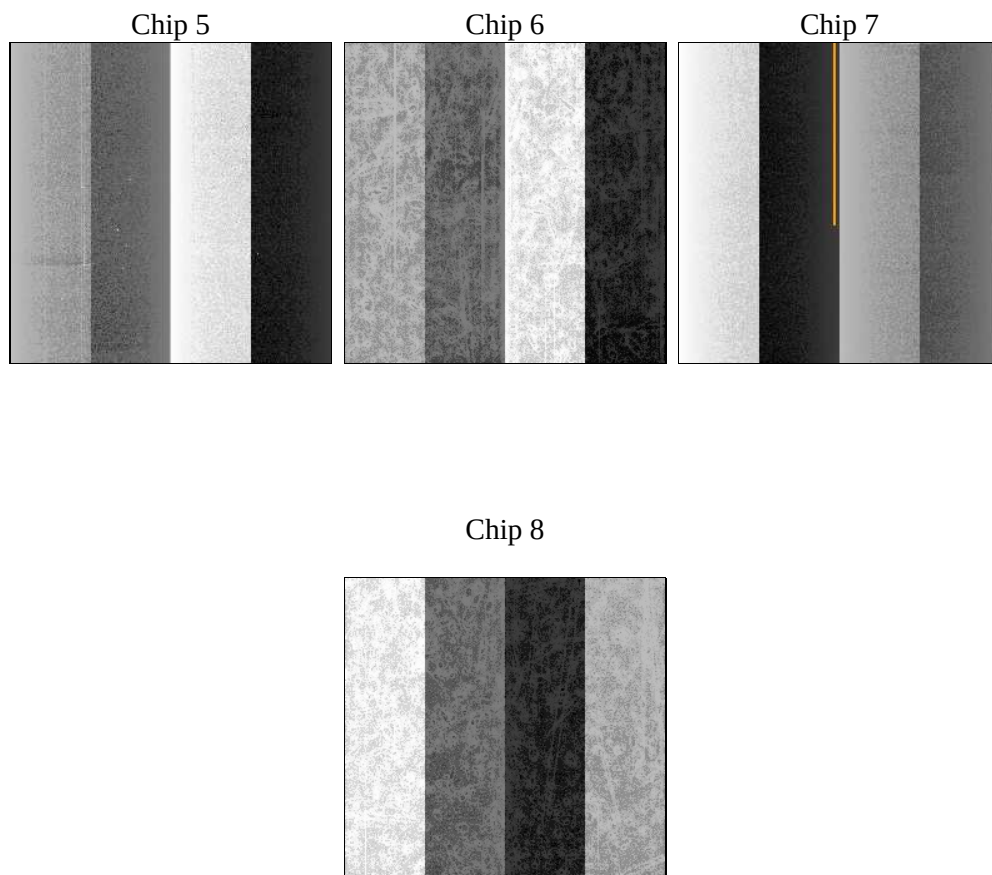
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	25868.280000	[s] Scheduled observation exposure time
ascdsver	10.8.1	Processing system revision	ontime	25930.181418538	Sum of GTIs [s]
caldsver	4.8.4.2	 	ontime5	25930.140378594	Sum of GTIs [s]
date	2019-12-22T22:32:33	Date and time of file creation	ontime6	25930.099338531	Sum of GTIs [s]
revision	1	Processing version of data	ontime7	25930.181418538	Sum of GTIs [s]
			ontime8	25930.058298588	Sum of GTIs [s]
			l1events	1194042	Number of level 1 events
			tgmethod	TGDETECT	Method used to create src1a file
			zo_pos	(4133.64, 4069.98)	src1a sky pixel position

2.1.4 Events

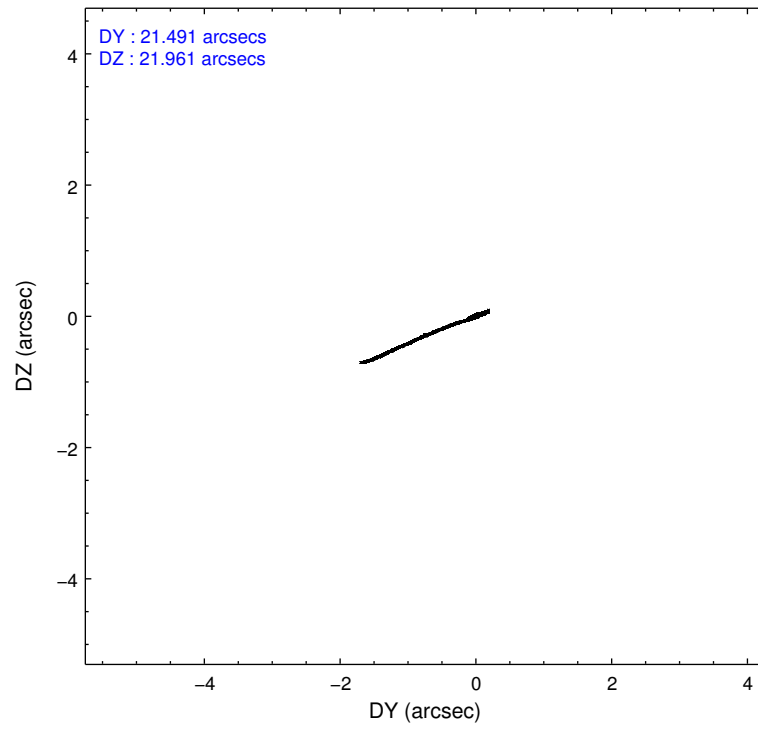
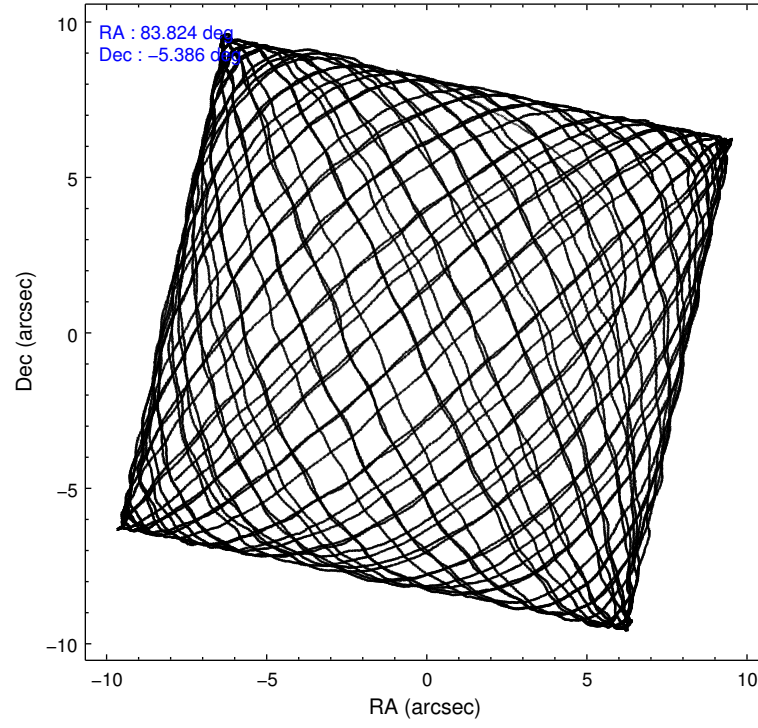
	ccd 5	ccd 6	ccd 7	ccd 8
level 1 events	381306	230752	309072	272912
rejected events	183814	187554	153050	197832
rejected %	48%	81%	49%	72%

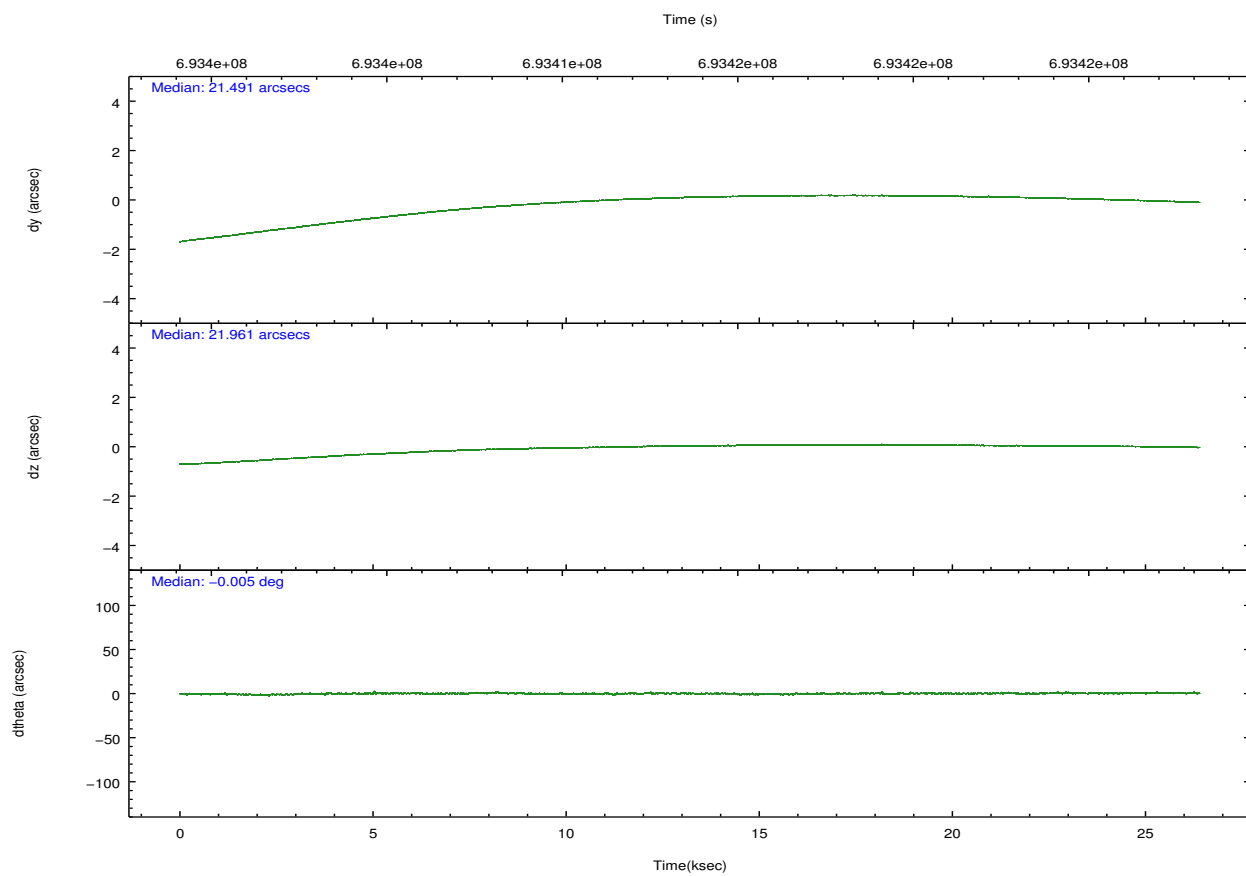
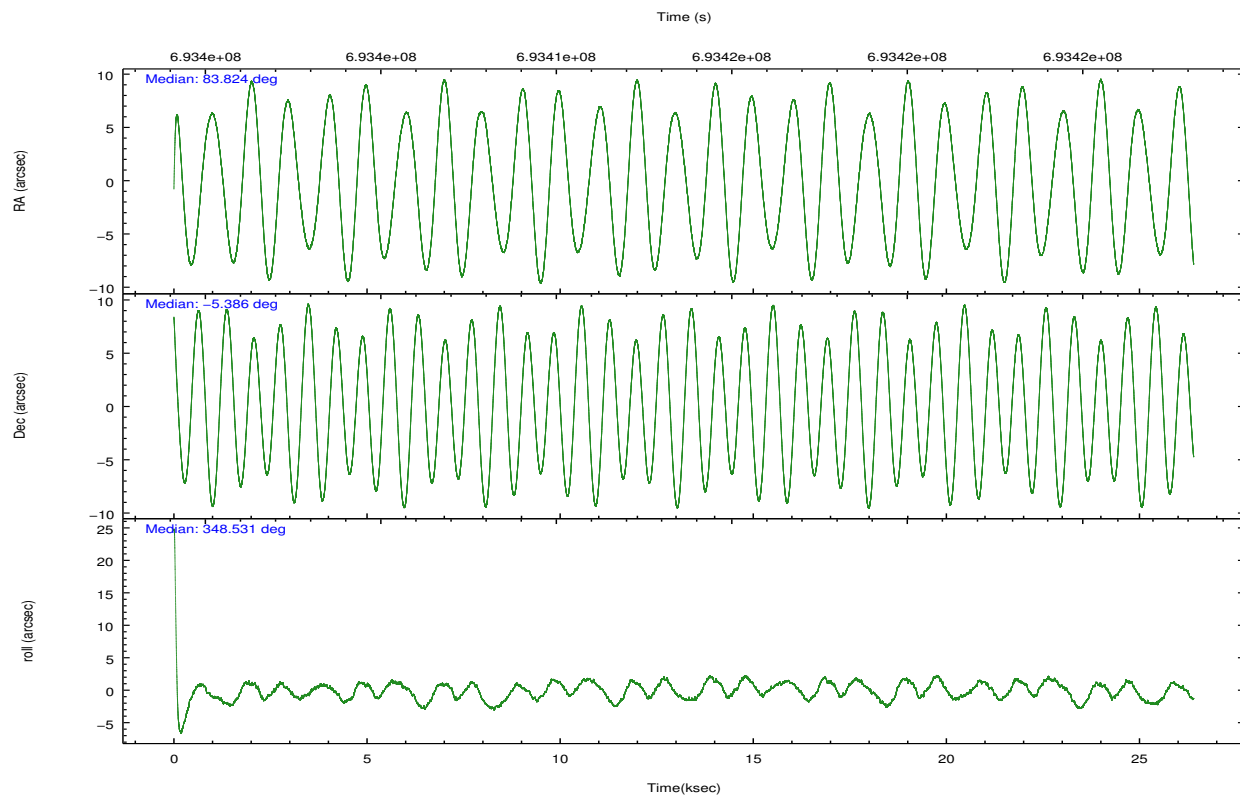
	ccd 5	ccd 6	ccd 7	ccd 8
grade 0 events	43604	21258	18347	25121
	11%	9%	5%	9%
grade 1 events	1151	141	585	198
	0%	0%	0%	0%
grade 2 events	55911	9992	34216	17550
	14%	4%	11%	6%
grade 3 events	4948	2315	13448	6758
	1%	1%	4%	2%
grade 4 events	4578	2550	13163	6419
	1%	1%	4%	2%
grade 5 events	23502	8357	25790	13582
	6%	3%	8%	4%
grade 6 events	88526	7093	76889	19287
	23%	3%	24%	7%
grade 7 events	159086	179046	126634	183997
	41%	77%	40%	67%

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	83.797612	83.82363952482723	CCD I2 on	N	N
[deg] Pointing Dec	-5.395098	-5.386028234816409	CCD I3 on	N	N
[deg] Pointing Roll	348.380548	348.5396336196861	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)	693400983.184000	693399779.04325	CCD S5 on	O2	N
Observation start date	2019-12-22T11:21:54	2019-12-22T11:02:59	Number of optional ACIS chips dropped	2	2
[s] Observation end time (MET)	693426852.184000	693427257.75741	On-chip summing requested	N	N
Observation end date	2019-12-22T18:33:03	2019-12-22T18:40:57	Subarray requested	NONE	NONE
Read mode	TIMED	TIMED	Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	3.1

2.3 Aspect



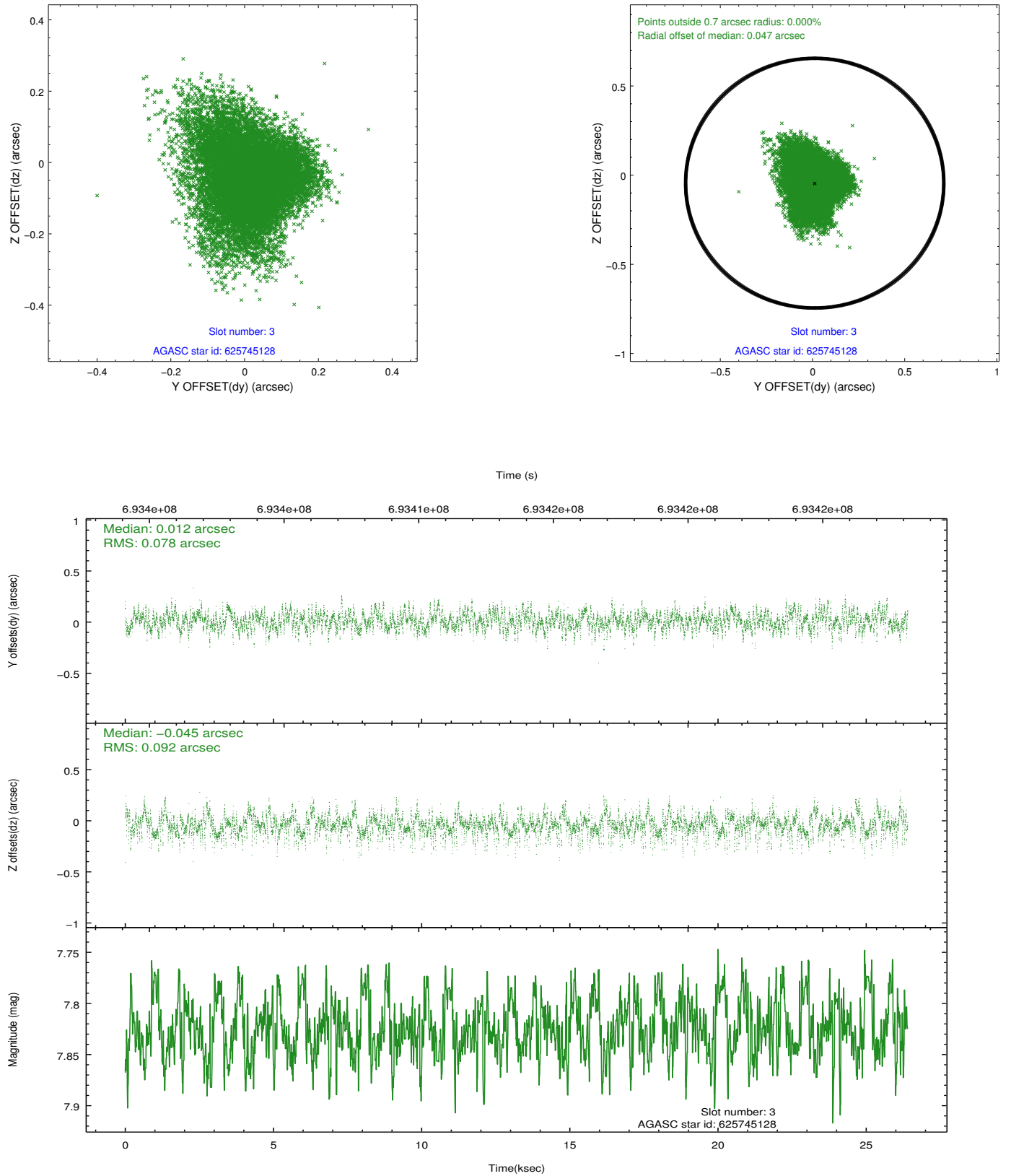


Slot Statistics

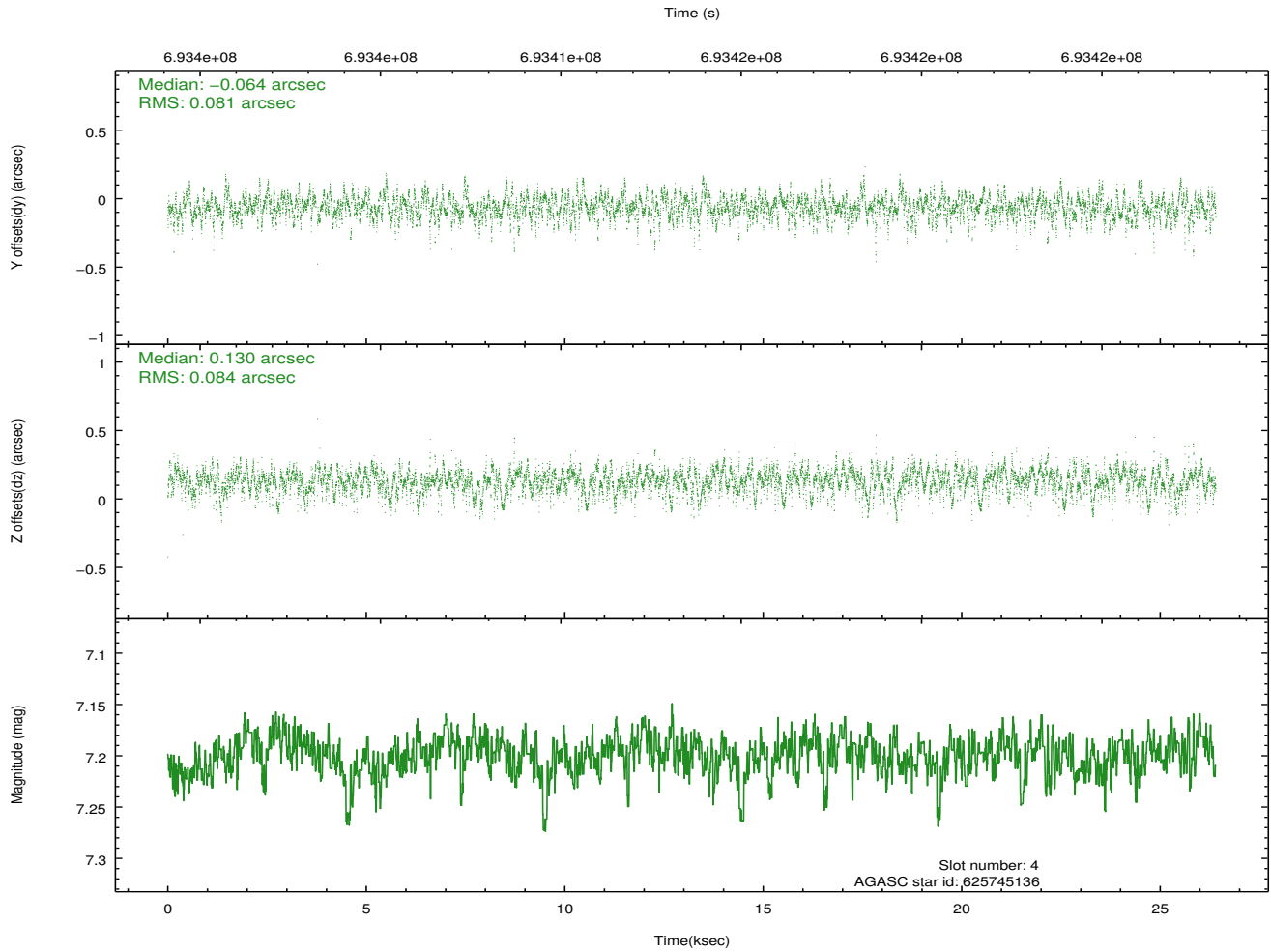
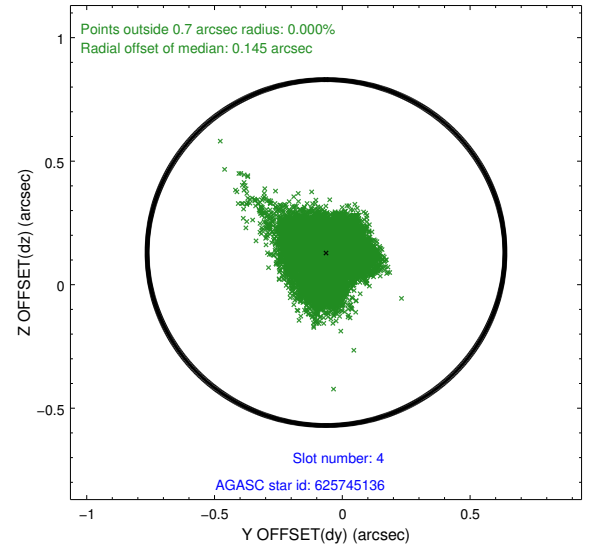
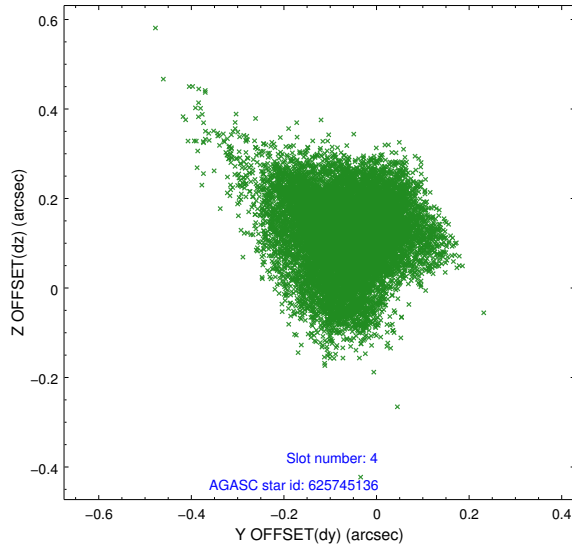
pt	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mea
0	FID		ACIS-S-3	7.42	6439	1.000	-0.258	-0.265	0.015	0.028	0.000000	0.000000	38.59	-1872
1	FID		ACIS-S-4	7.29	6440	1.000	0.785	0.258	0.022	0.033	0.000000	0.000000	2139.75	165
2	FID		ACIS-S-5	7.27	6439	1.000	-0.555	0.016	0.015	0.022	0.000000	0.000000	-1827.65	158
3	GUIDE	used	625745128	7.83	12881	1.000	0.012	-0.045	0.127	0.214	83.769930	-4.731835	-578.68	2318
4	GUIDE	used	625745136	7.20	12863	1.000	-0.064	0.130	0.124	0.199	83.600341	-4.804339	-1121.84	1940
5	GUIDE	used	625874672	7.68	12804	1.000	-0.235	-0.609	0.122	0.194	84.403143	-4.934124	1792.67	2061
6	GUIDE	used	626272760	6.65	12880	1.000	0.119	-0.089	0.171	0.333	84.363987	-5.938389	2381.04	-1508
7	GUIDE	used	626272880	7.68	12880	1.000	0.149	0.629	0.127	0.219	83.815609	-6.032748	526.03	-2235

2.4 Star Slots

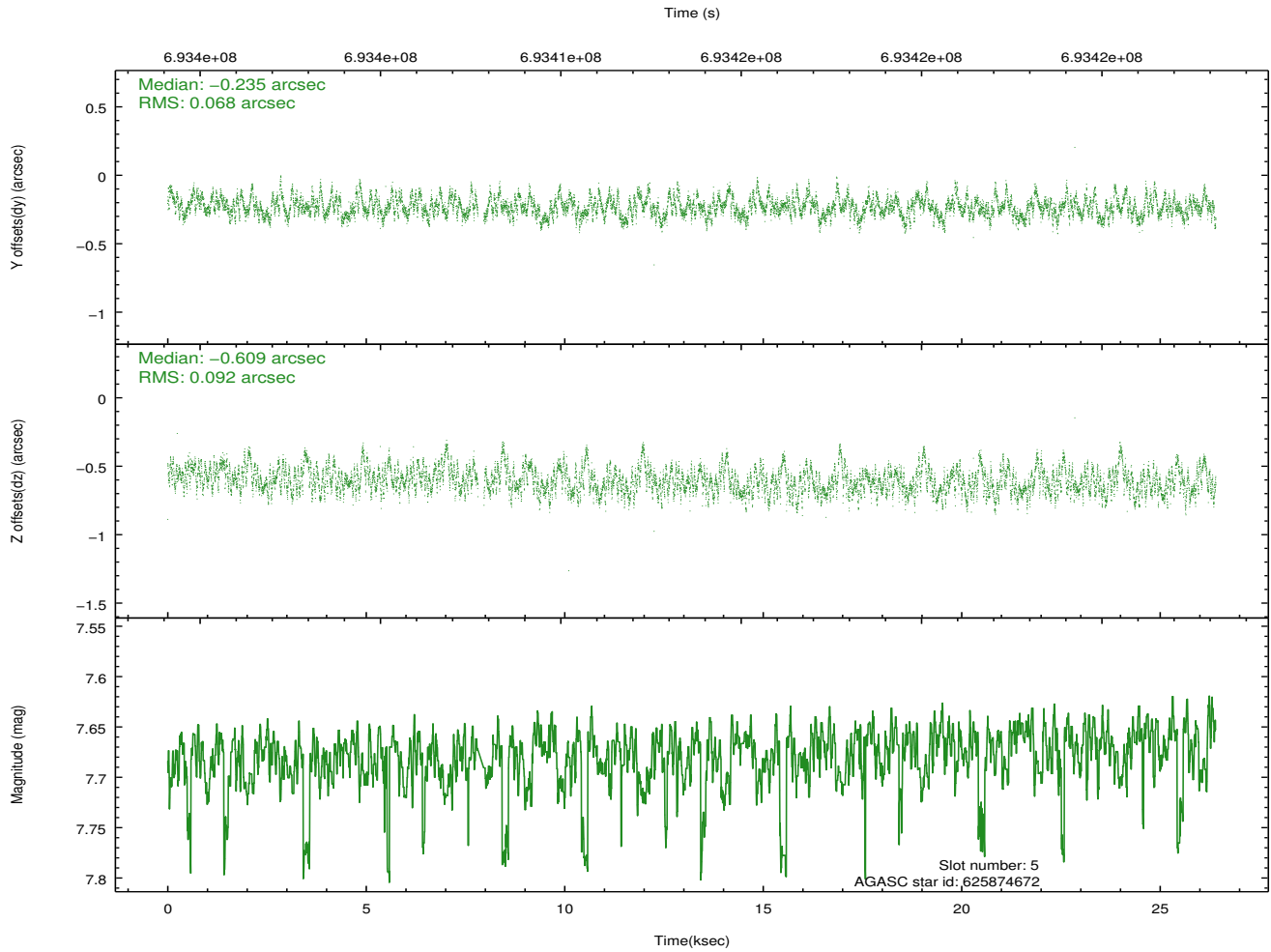
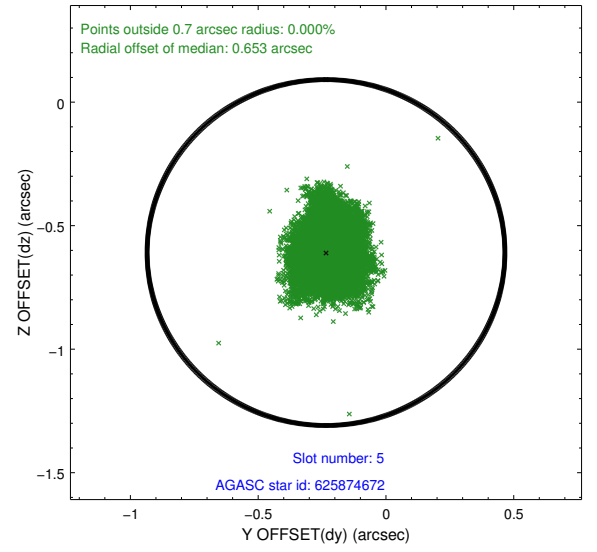
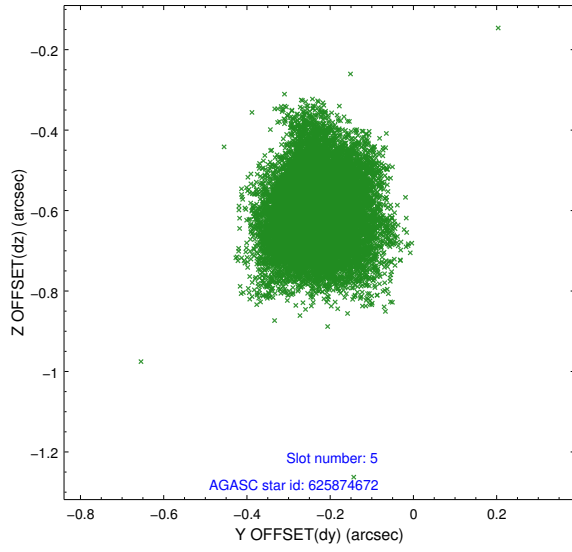
2.4.1 Slot 3



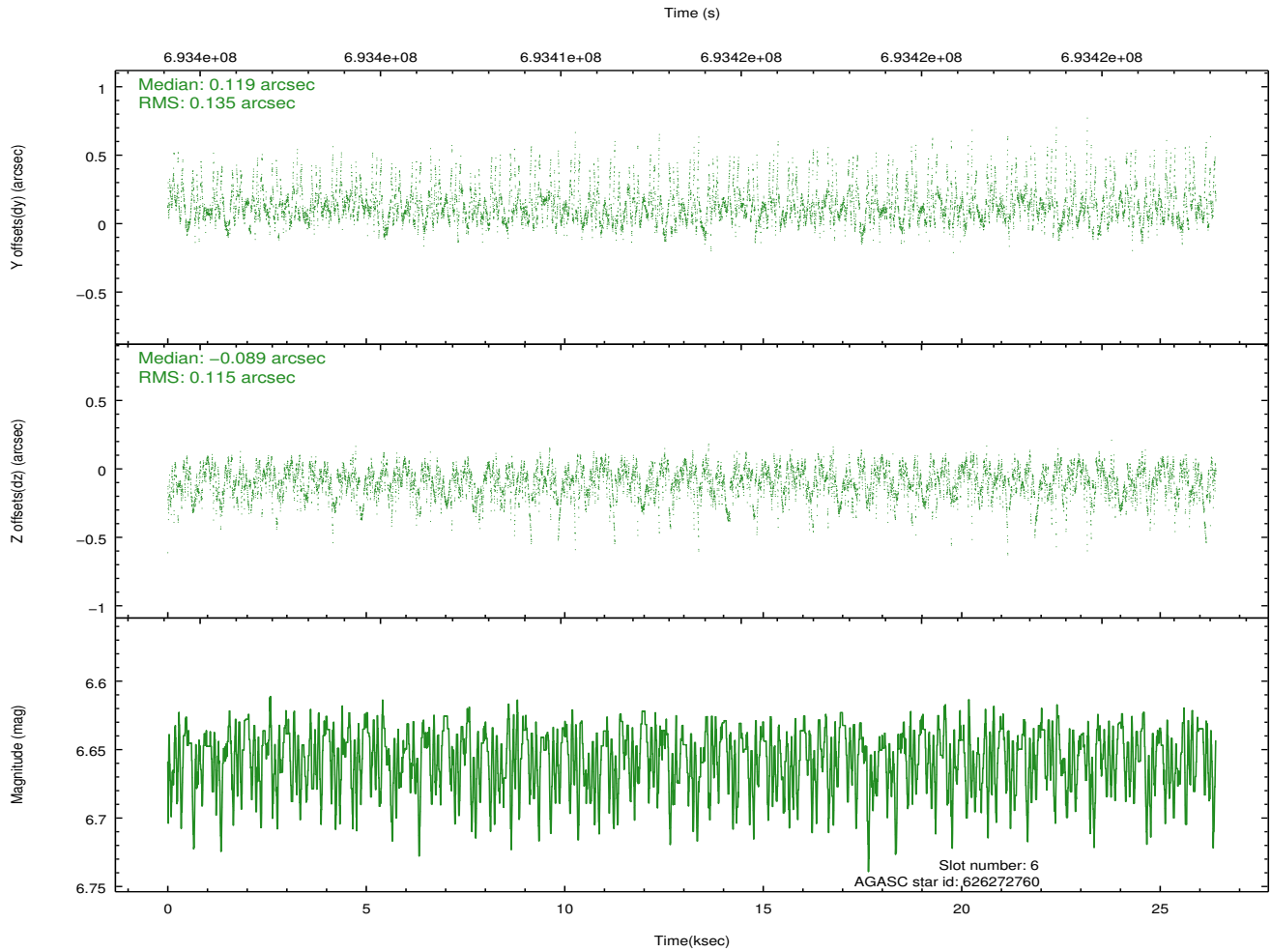
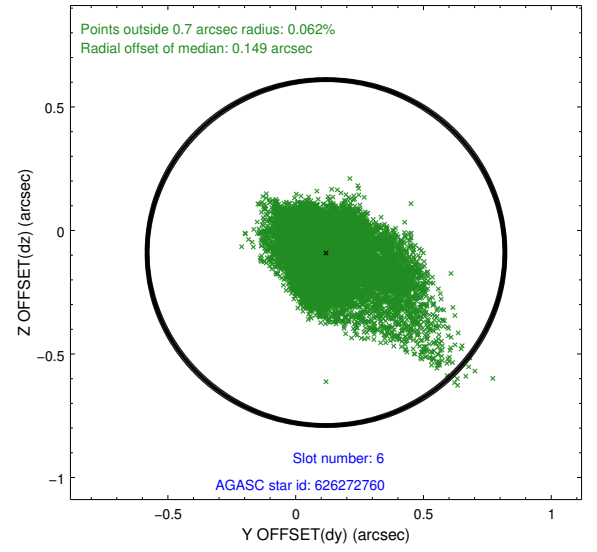
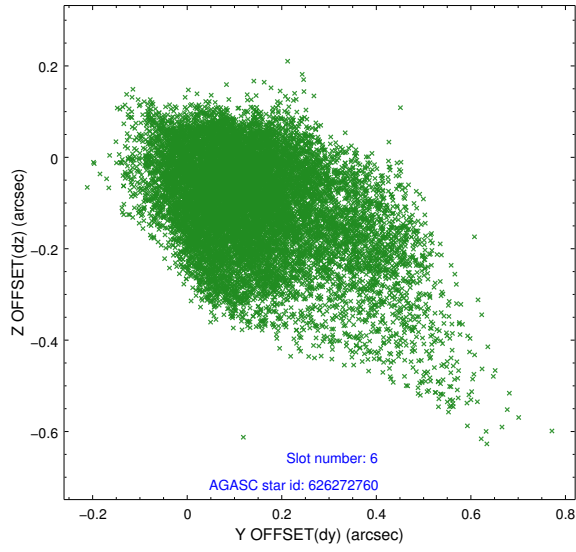
2.4.2 Slot 4



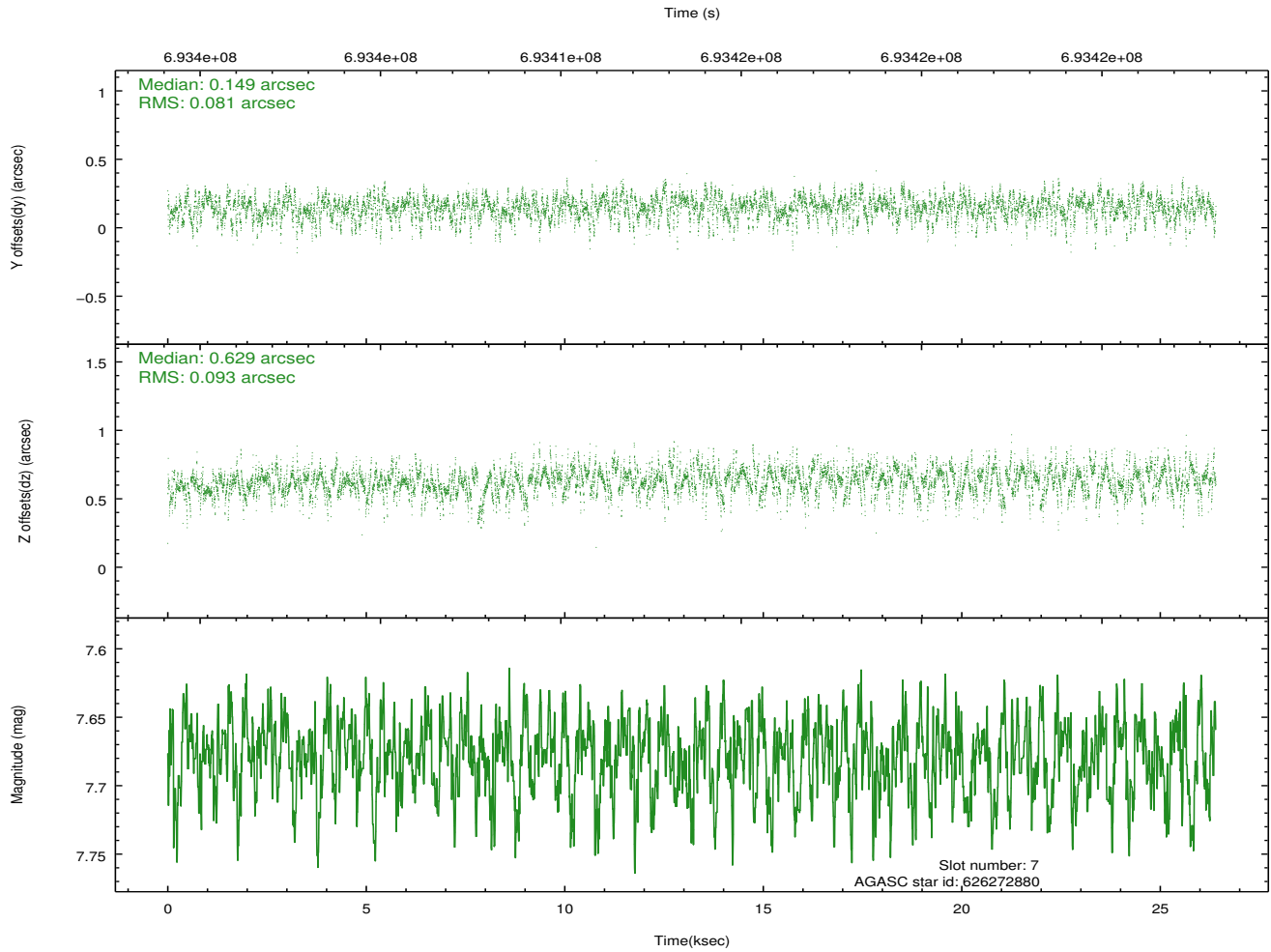
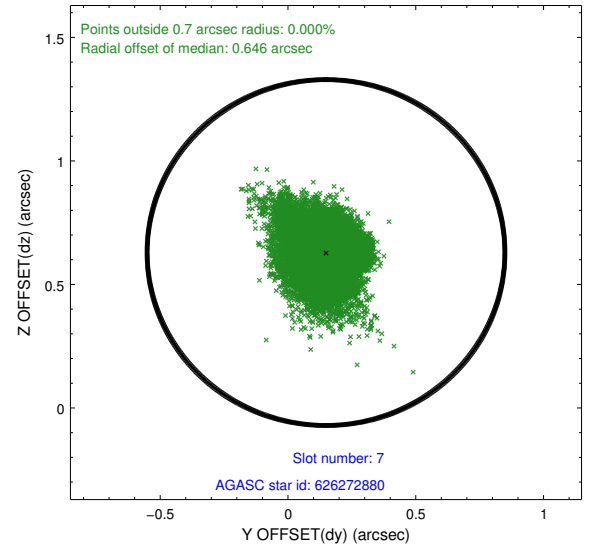
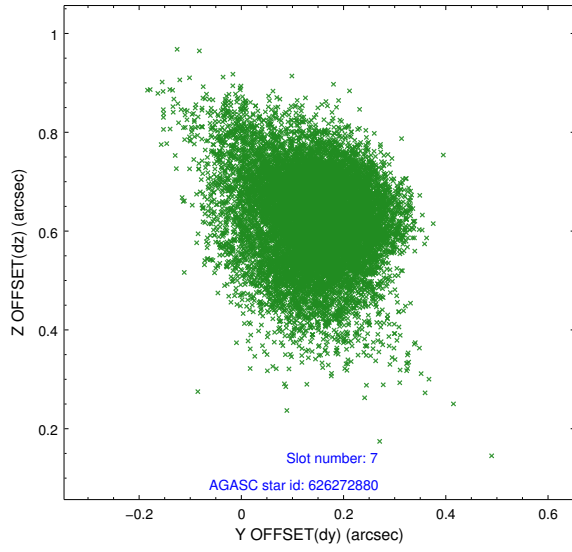
2.4.3 Slot 5



2.4.4 Slot 6

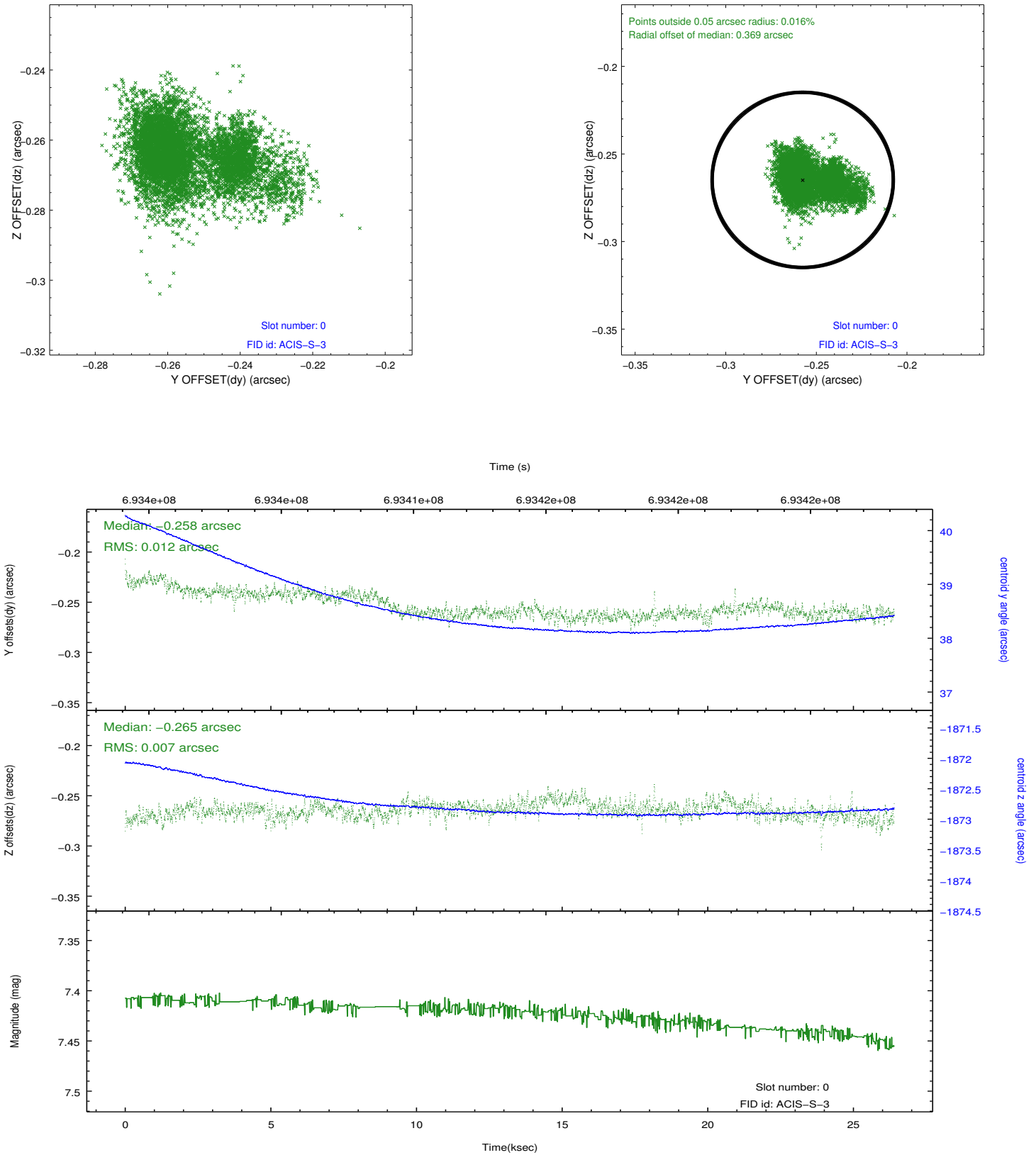


2.4.5 Slot 7

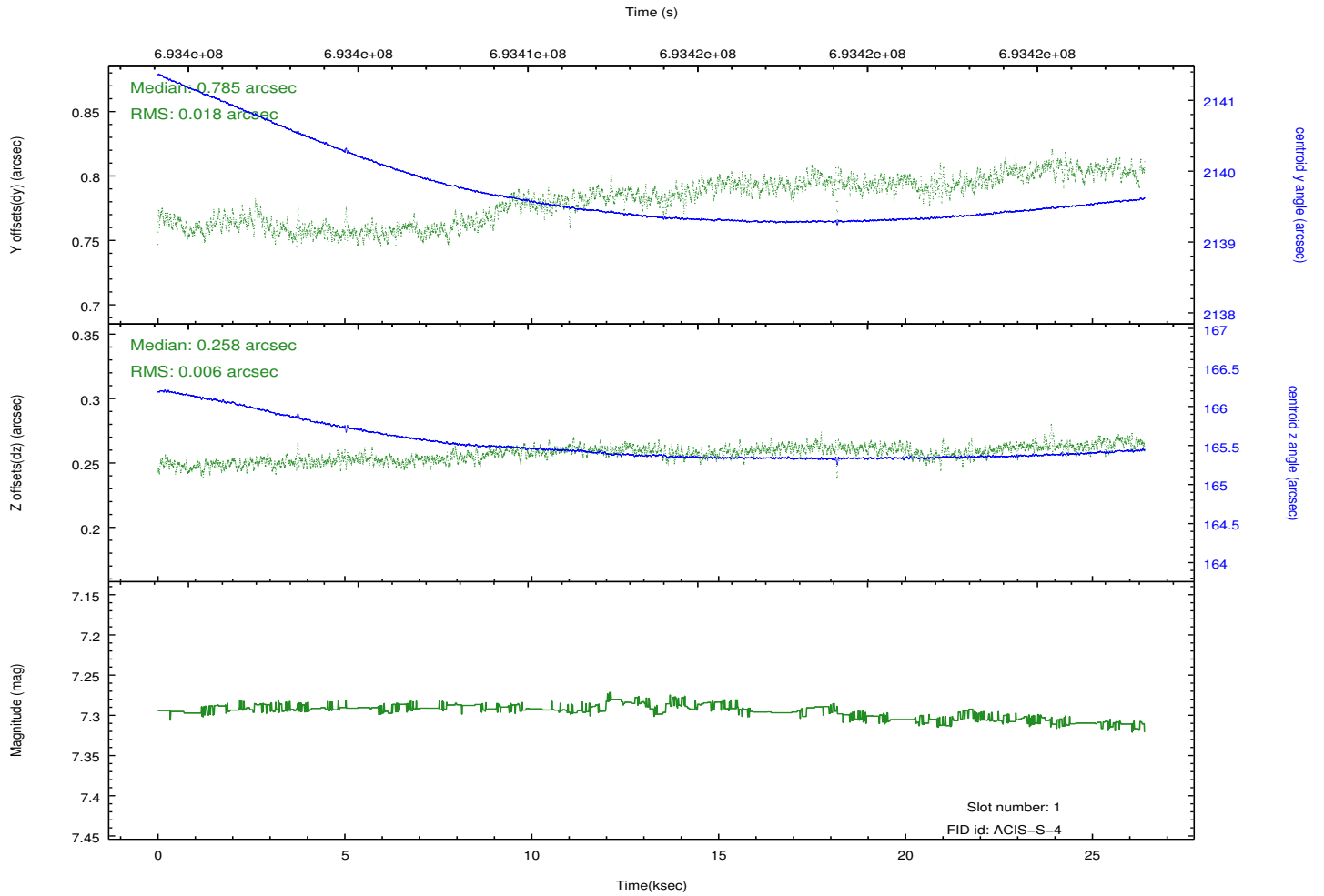
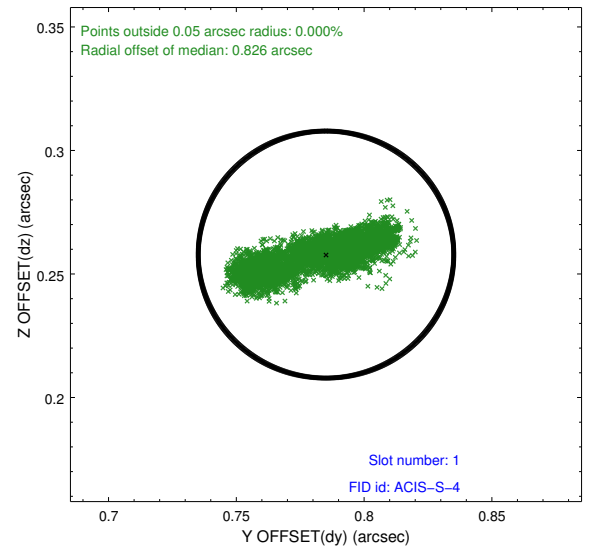
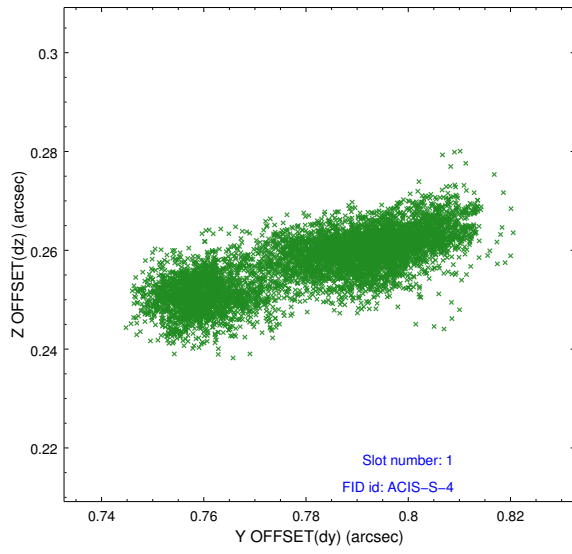


2.5 FID Slots

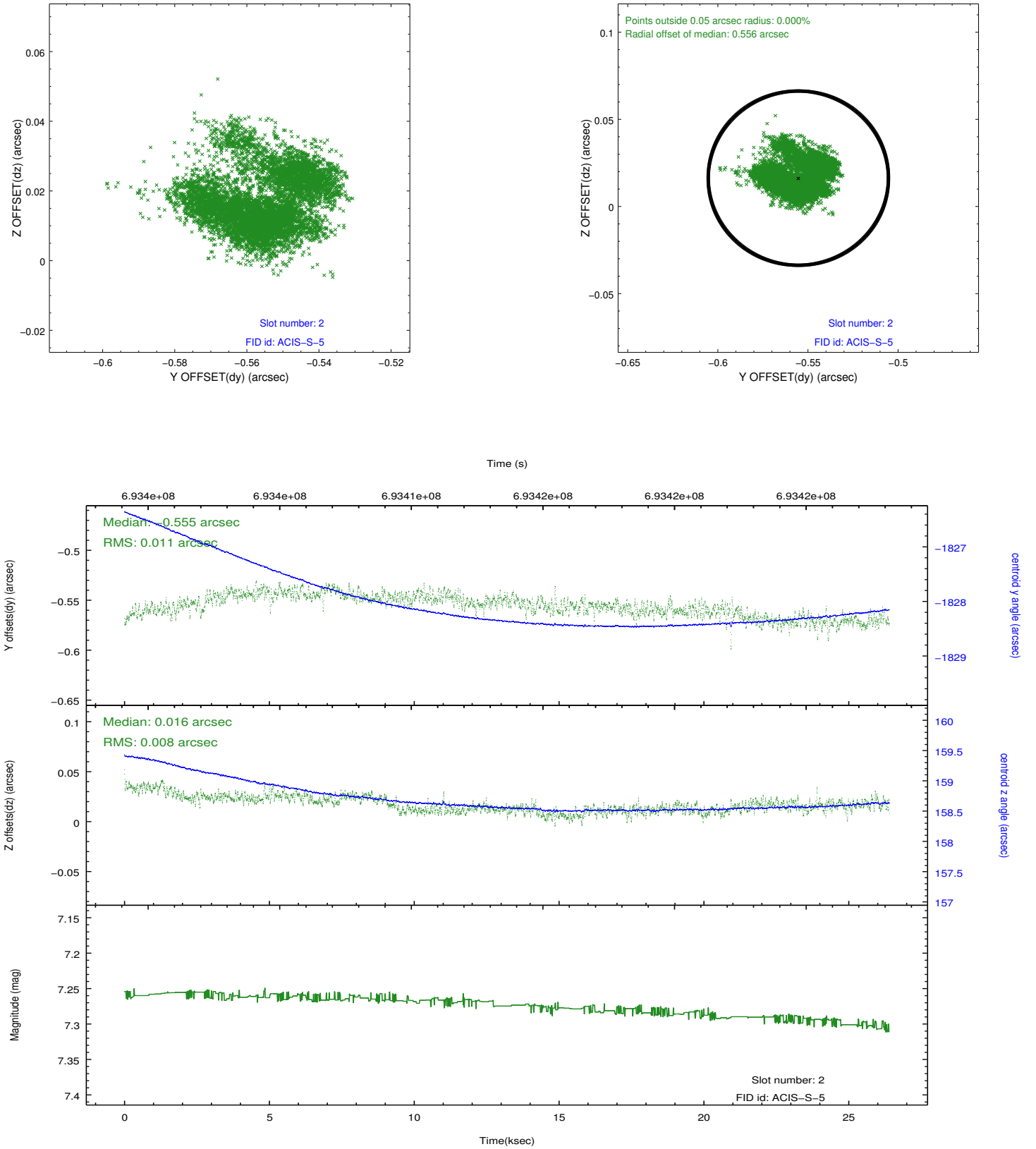
2.5.1 Slot 0



2.5.2 Slot 1

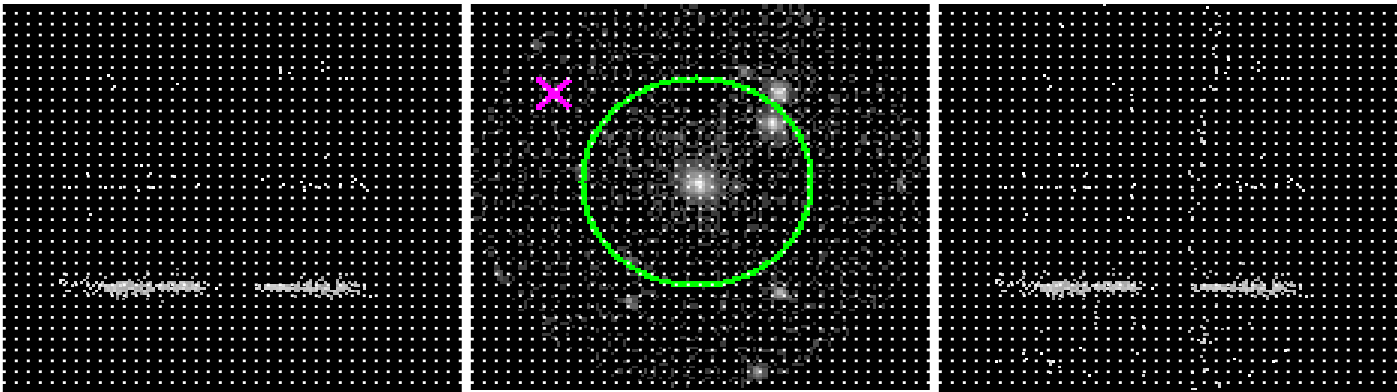


2.5.3 Slot 2



3 Gratings

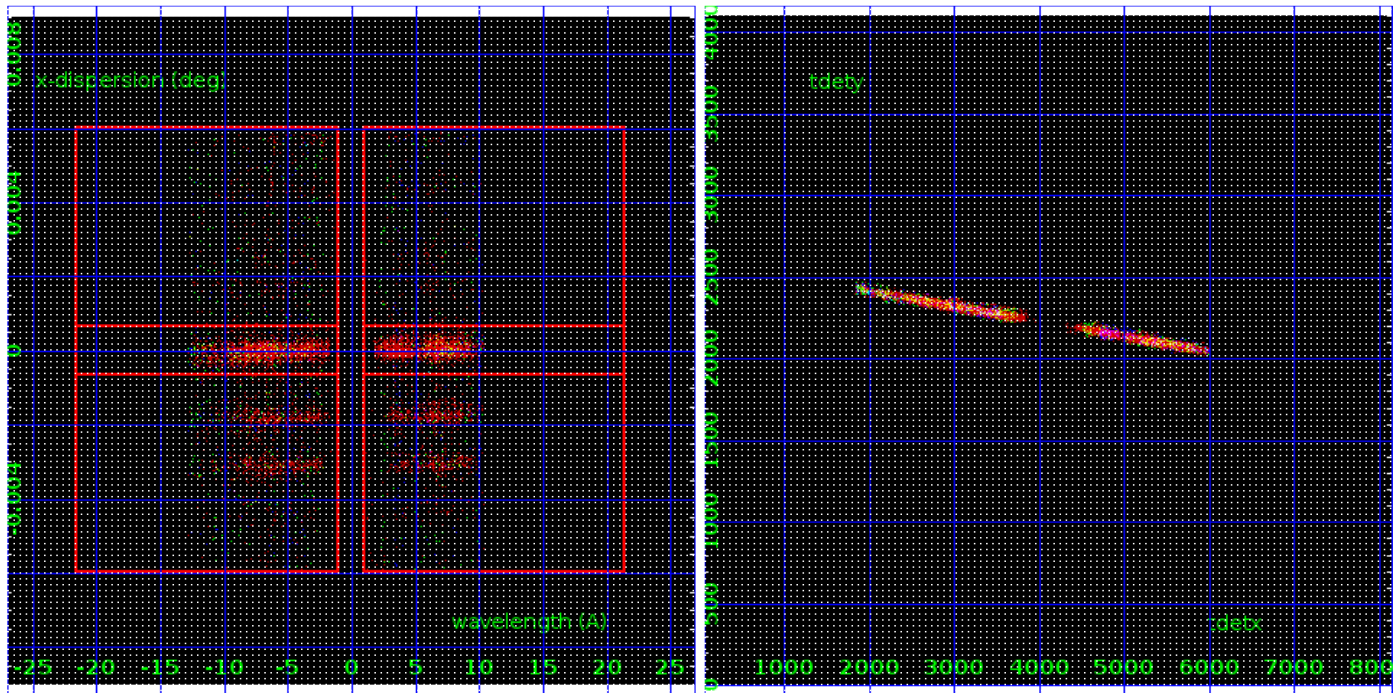
3.1 HEG Arm



HEG Order Sort 123

HEG Zero Order

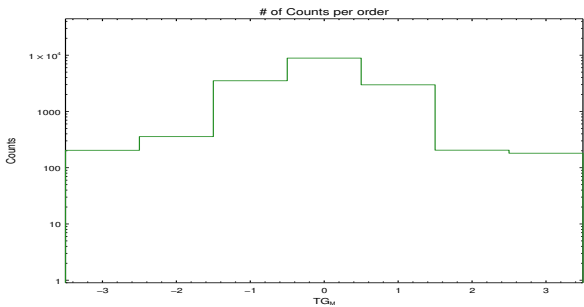
HEG Order Sort ALL

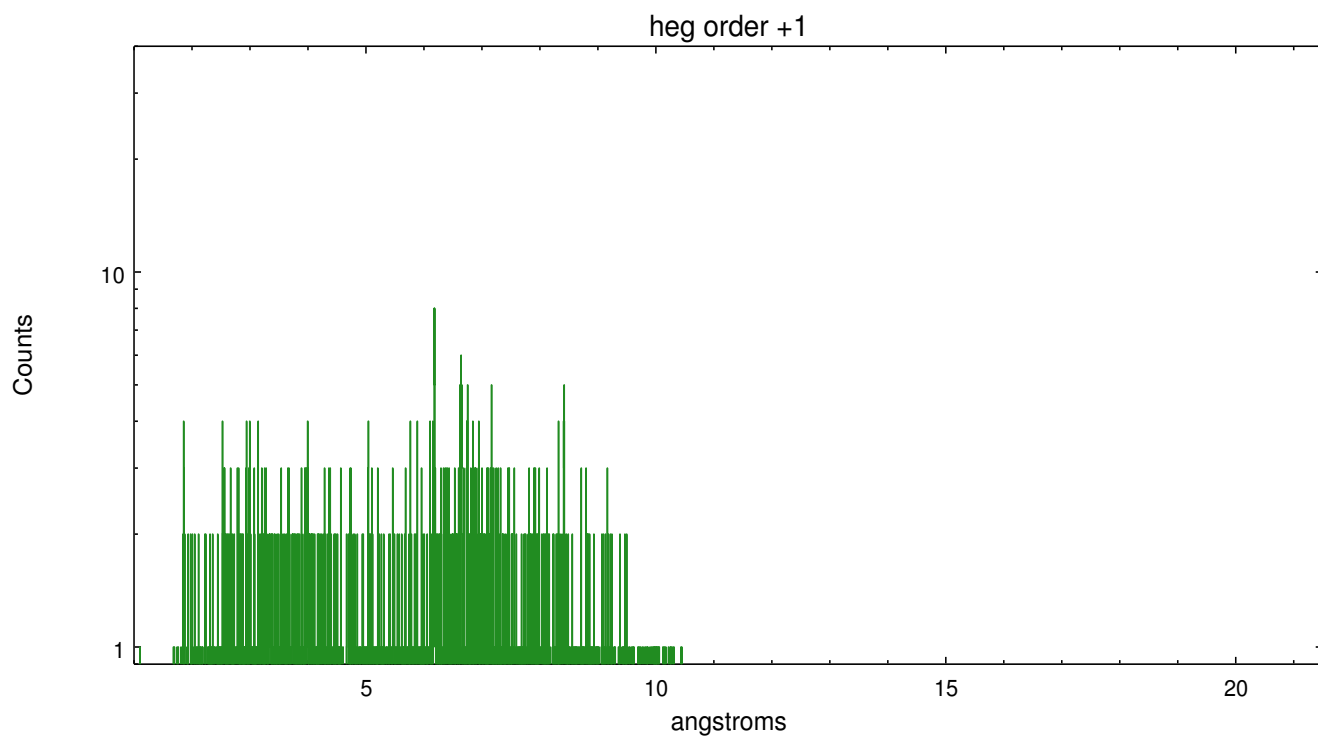
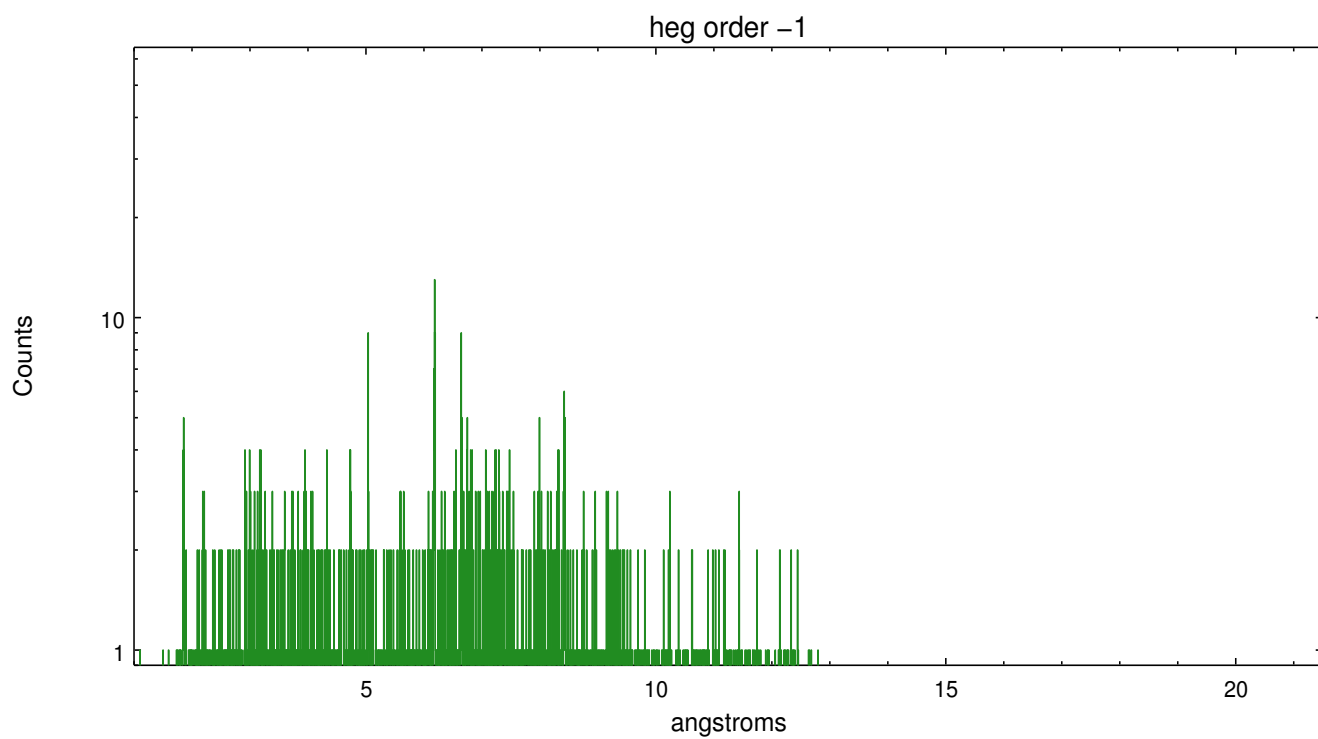


Spot Image HEG

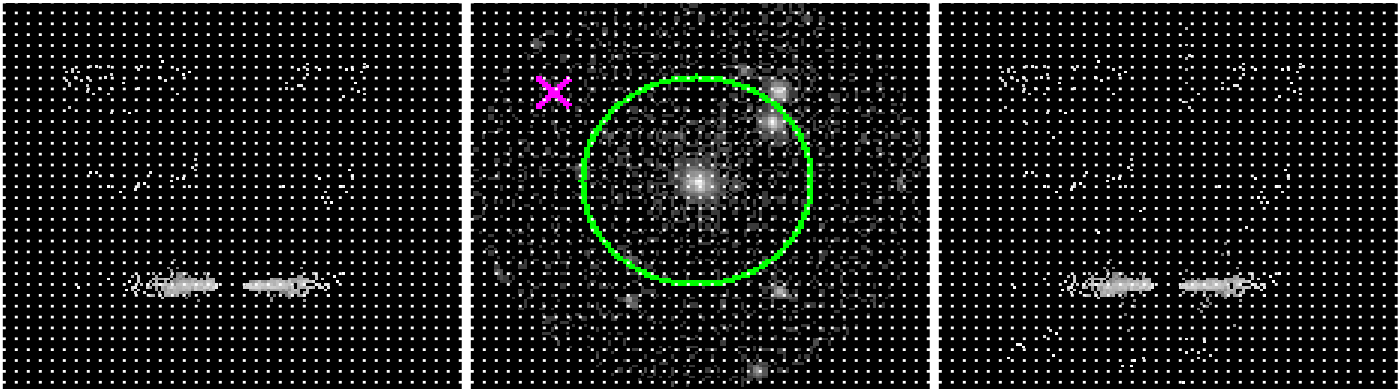
Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	204	357	3514	8884	2976	205	181





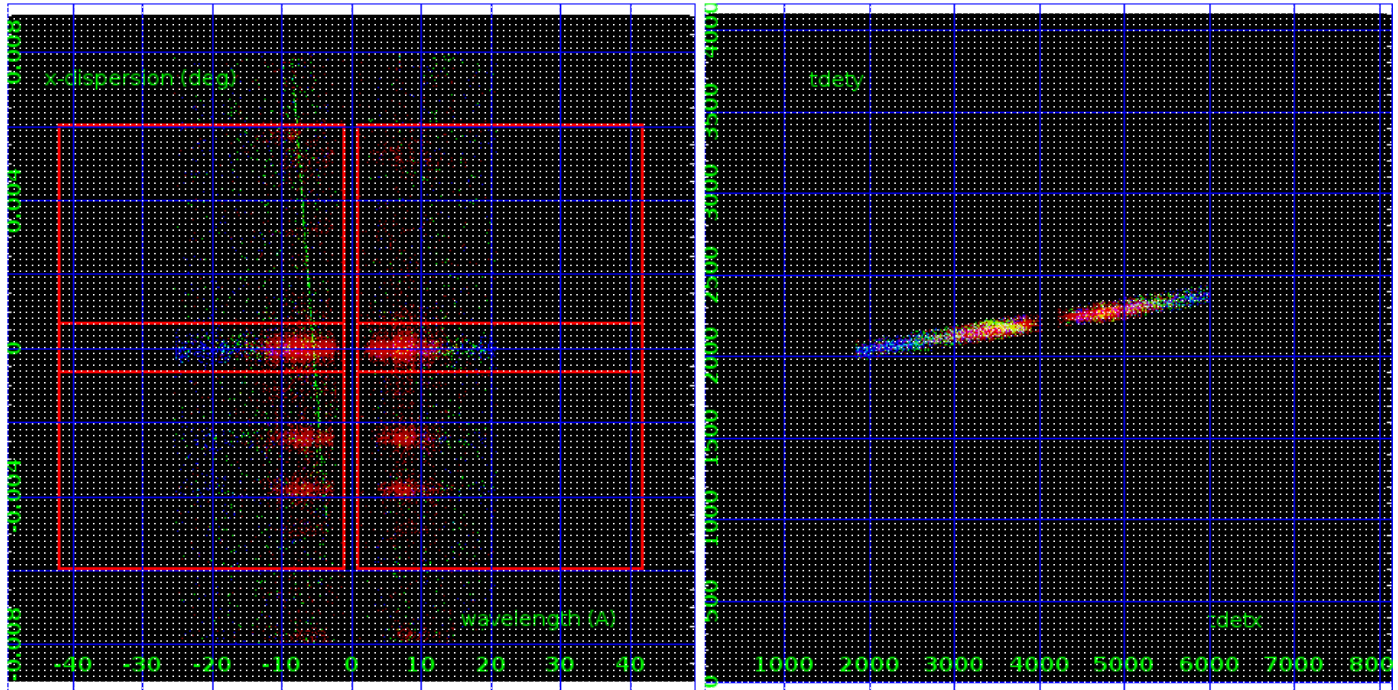
3.2 MEG Arm



MEG Order Sort 123

MEG Zero Order

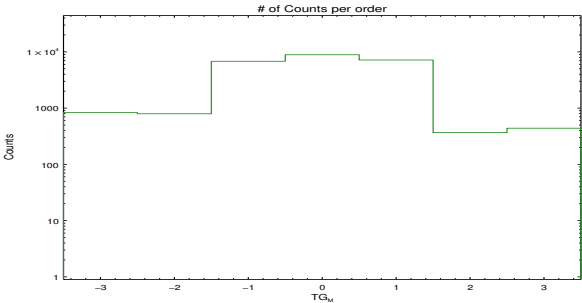
MEG Order Sort ALL

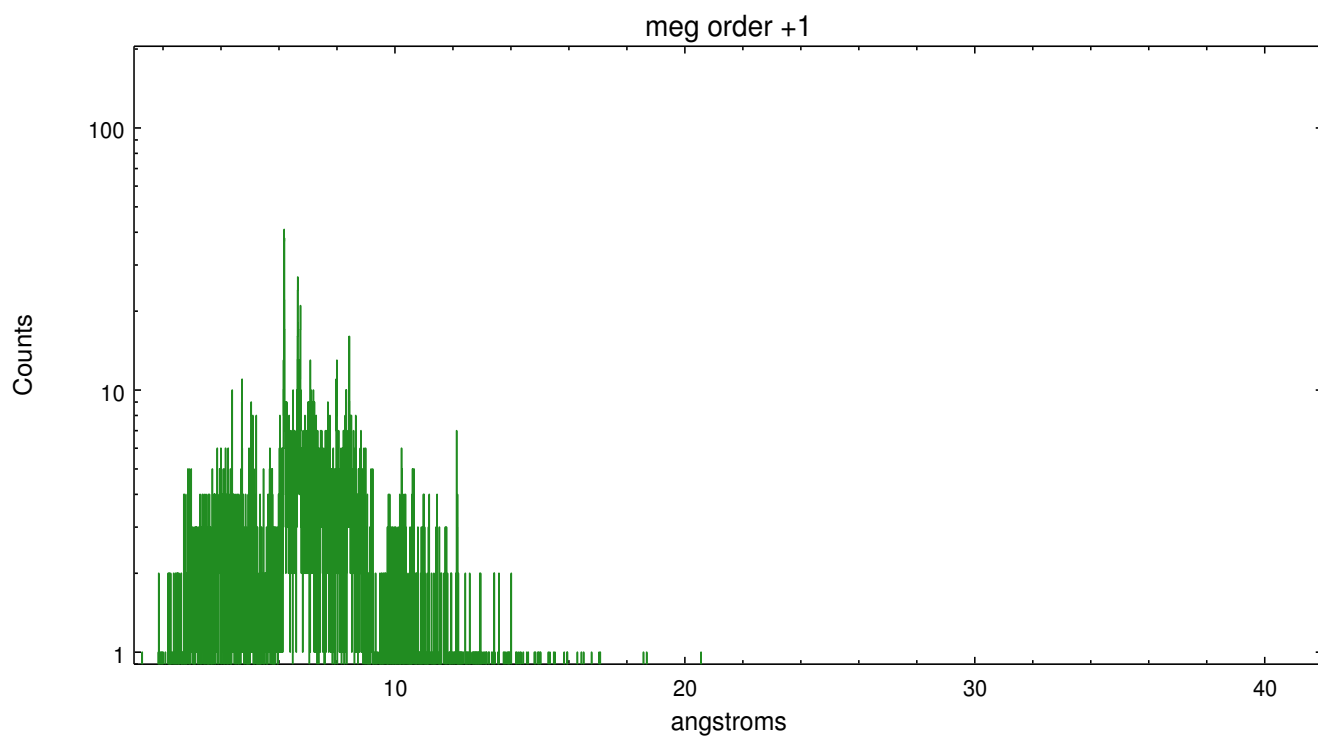
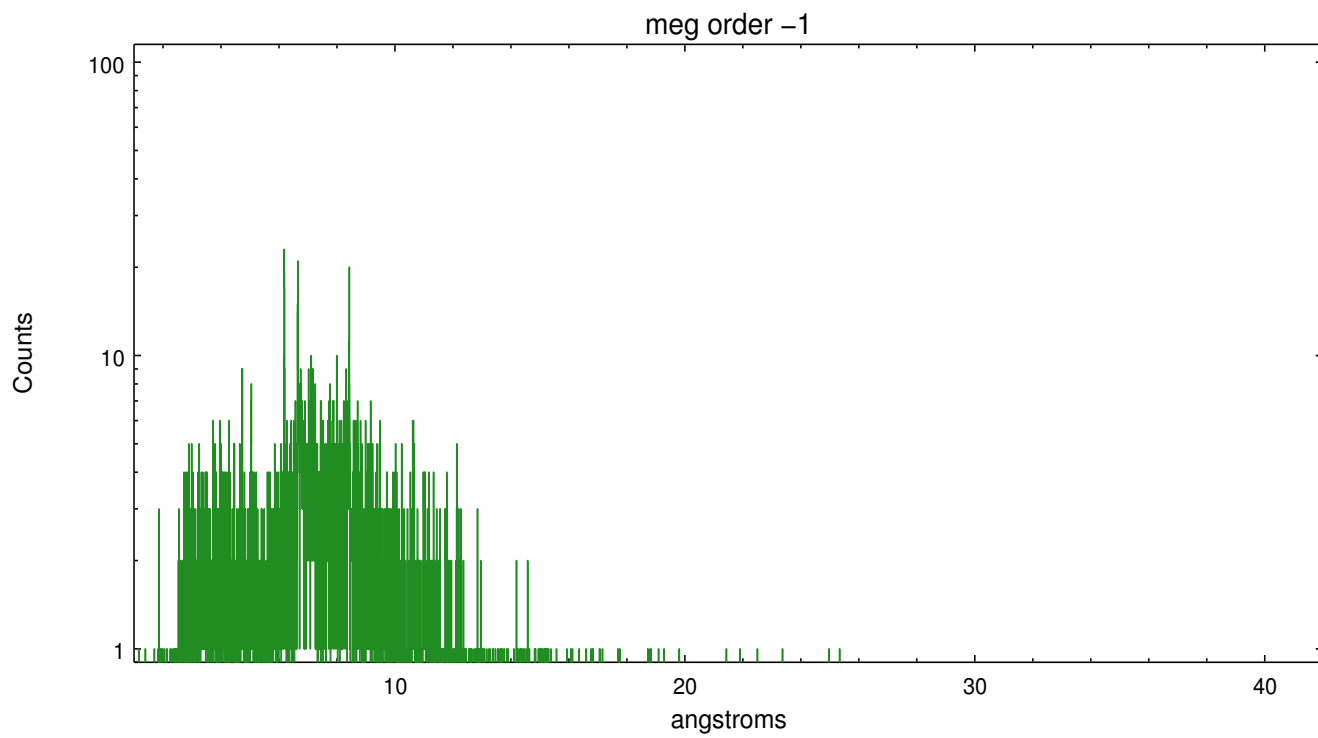


Spot Image MEG

Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	831	793	6799	8884	7159	367	439





A Summary

A.1 Status

V&V Scientist	Melania Nynka
V&V Date (YYYY-MM-DD)	2019.12.25
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	25.930181418538

A.2 Comments

The focal plane temperature during the interval 693425243.99 - 693426843.59 (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.