

V&V Reference Report

L2 ASCDS Version : 8.4.3

Observation 13219 - L2 Version 3
Chandra X-Ray Center

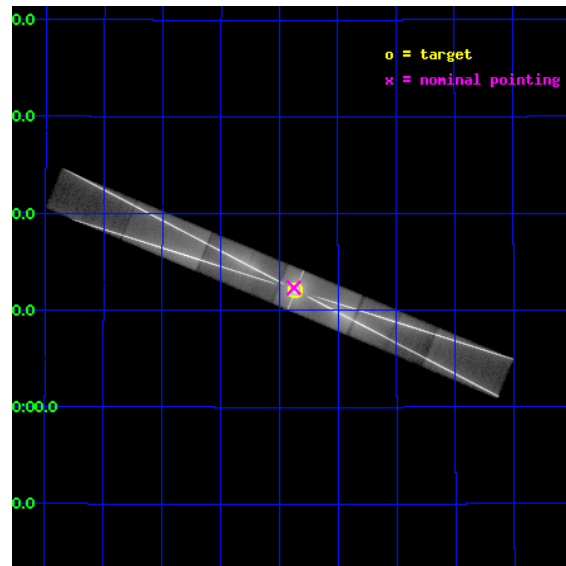
L2 Processing Date : Feb 6 2012

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1 Front

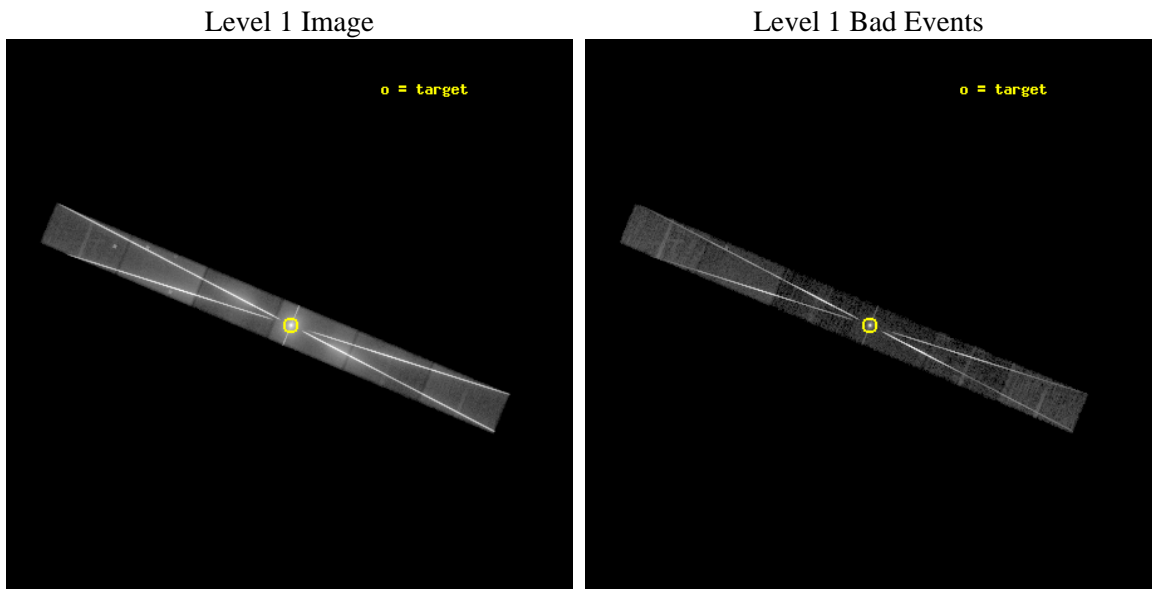
seq_num	401292	Sequence number
obs_id	13219	Observation id
title	Measuring the Spin of the Black Hole Cgynus X-1, Phase 2	Proposal
observer	Dr. Jeffrey McClintock	Principal investigator
object	Cyg X-1	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	299.590417	Observer's specified target RA [deg]
dec_targ	35.201667	Observer's specified target Dec [deg]
ra_nom	299.59385796281	Nominal RA [deg]
dec_nom	35.205589670112	Nominal Dec [deg]
roll_nom	22.601437863111	Nominal Roll [deg]
revision	3	Processing version of data
ontime	4519.7511941195	Sum of GTIs [s]
livetime	4418.9980388341	Livetime [s]
ontime4	10021.094498336	Sum of GTIs [s]
ontime5	8410.1429908276	Sum of GTIs [s]
ontime6	3433.8276447058	Sum of GTIs [s]
ontime7	4519.7511941195	Sum of GTIs [s]
ontime8	4563.9351583123	Sum of GTIs [s]
ontime9	9245.8281525373	Sum of GTIs [s]
l2events	3678806	Number of level 2 events



2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Parameters

obi_num	0	Obi number	sched_exp_time	12000.000000	[s] Scheduled observation exposure time
ascdsver	8.4.3	Processing system revision	ontime	4519.7511941195	Sum of GTIs [s]
caldsver	4.4.7	 	ontime4	10021.094498336	Sum of GTIs [s]
date	2012-02-03T16:19:27	Date and time of file creation	ontime5	8410.1429908276	Sum of GTIs [s]
revision	2	Processing version of data	ontime6	3433.8276447058	Sum of GTIs [s]
			ontime7	4519.7511941195	Sum of GTIs [s]
			ontime8	4563.9351583123	Sum of GTIs [s]
			ontime9	9245.8281525373	Sum of GTIs [s]
			l1events	4758142	Number of level 1 events

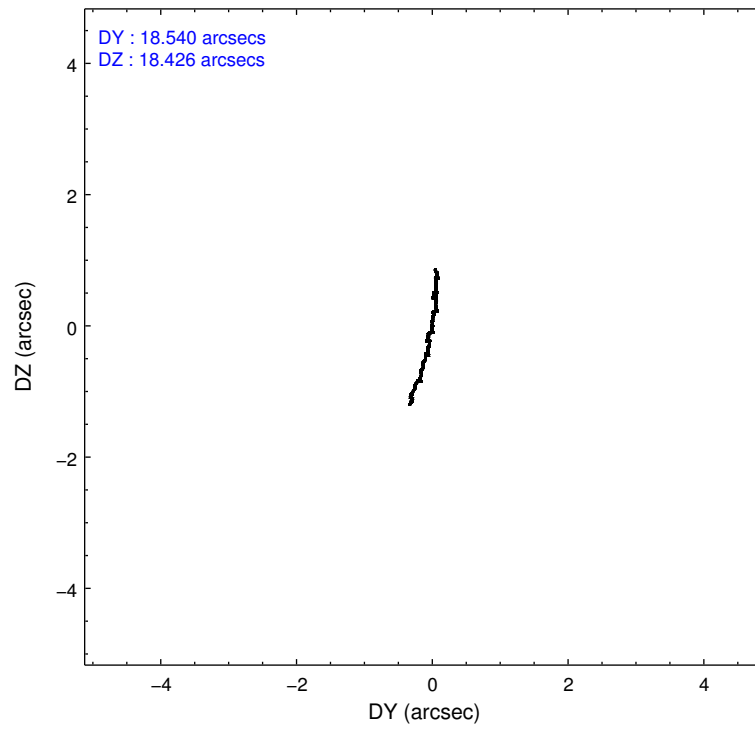
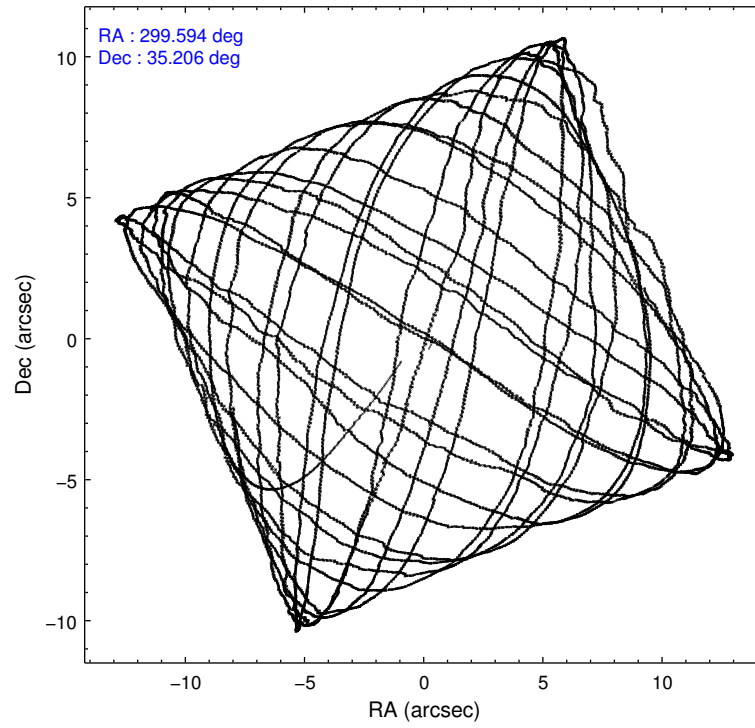
2.1.3 Events

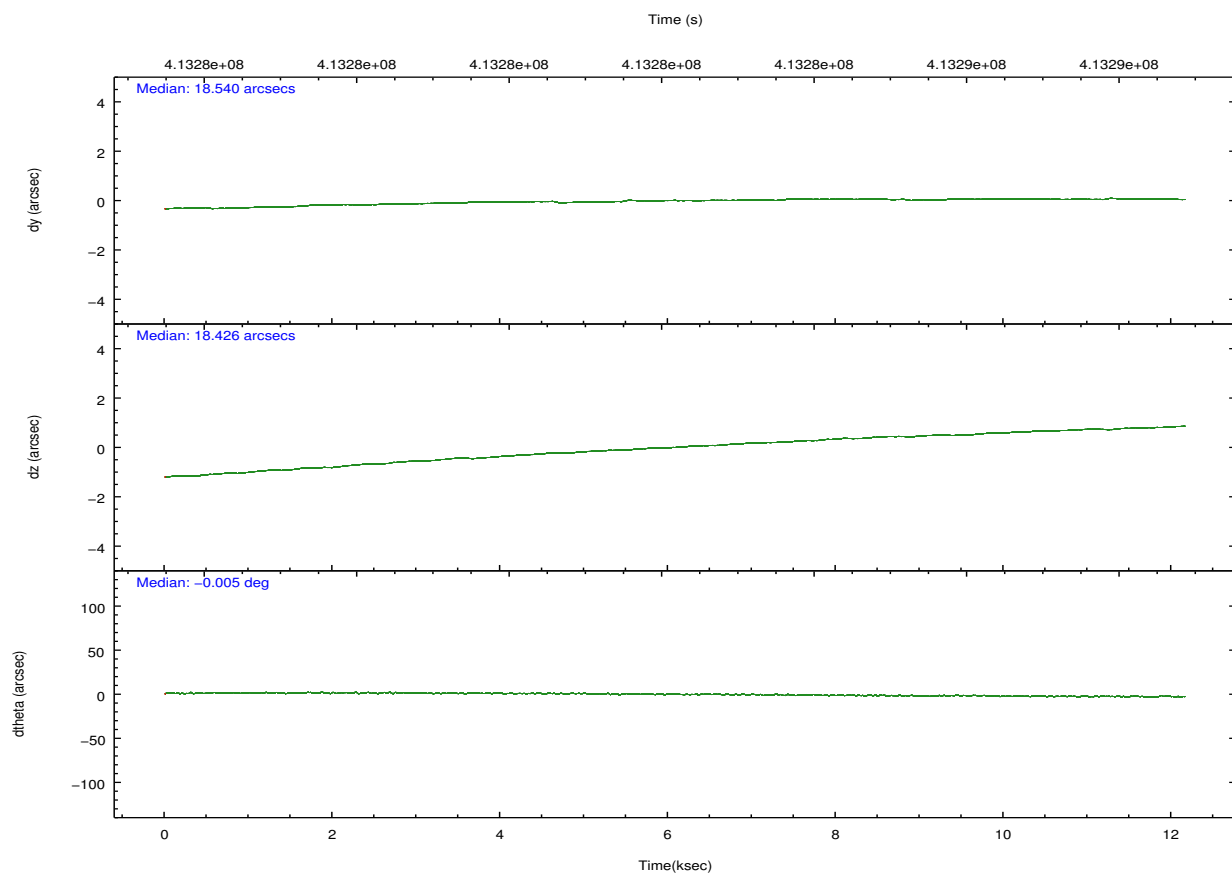
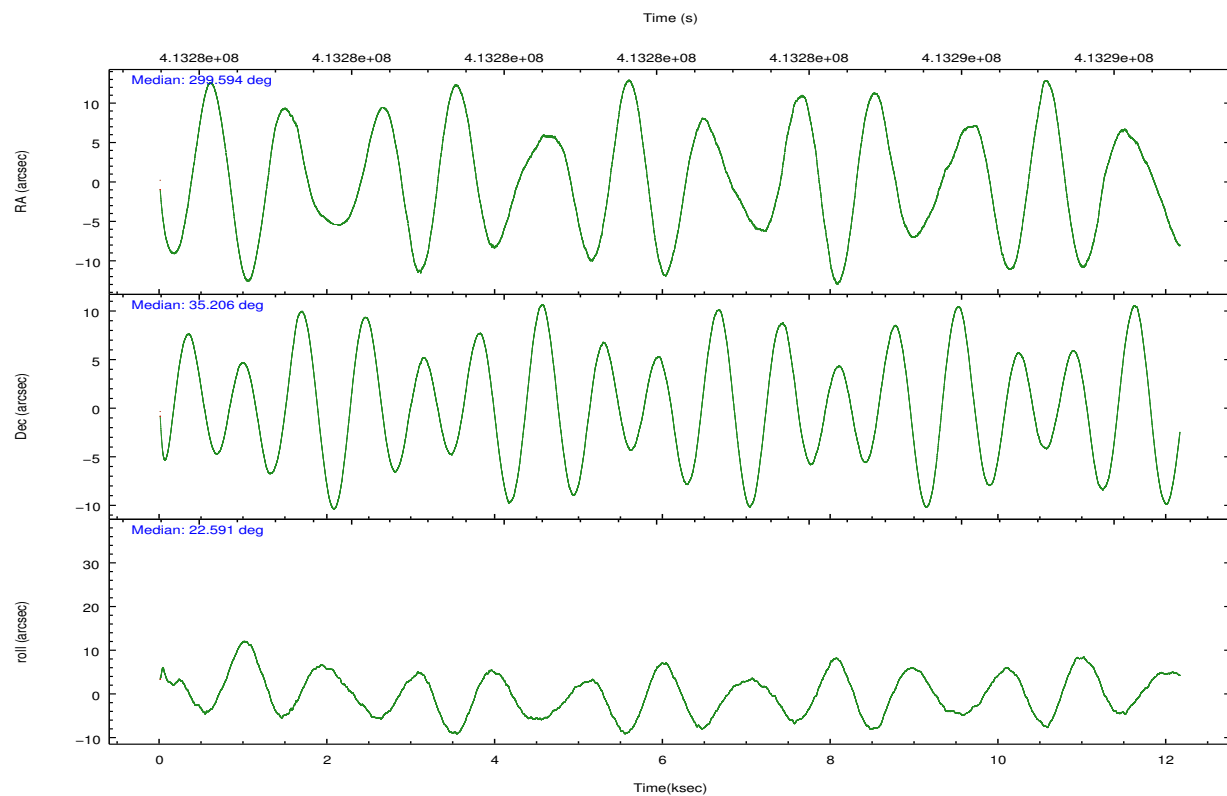
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9		ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	280830	1067490	940505	1136283	875677	457357	grade 0 events	189901	221592	482684	155841	556396	335046
rejected events	43303	162441	213804	314270	123000	39824		67%	20%	51%	13%	63%	73%
rejected %	15%	15%	22%	27%	14%	8%	grade 1 events	2120	9979	67264	9546	53973	5275
								0%	0%	7%	0%	6%	1%
							grade 2 events	29685	368082	113727	229981	98588	49060
								10%	34%	12%	20%	11%	10%
							grade 3 events	6647	59606	42225	79852	37021	12725
								2%	5%	4%	7%	4%	2%
							grade 4 events	6806	59267	41055	79313	36370	12629
								2%	5%	4%	6%	4%	2%
							grade 5 events	2433	48282	56694	46952	32576	4066
								0%	4%	6%	4%	3%	0%
							grade 6 events	4739	197162	47897	277356	24976	8258
								1%	18%	5%	24%	2%	1%
							grade 7 events	38499	103520	88959	257442	35777	30298
								13%	9%	9%	22%	4%	6%

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	GRADED	GRADED	Number of optional ACIS chips dropped	0	0
Observation mode	POINTING	POINTING	On-chip summing requested	N	N
[deg] Pointing RA	299.573928	299.5938579628051	Subarray requested	CUSTOM	1/2
[deg] Pointing Dec	35.183656	35.20558967011166	Subarray start row	257	257
[deg] Pointing Roll	22.456295	22.60143786311099	Subarray row count	512	512
[mm] SIM focus pos	-0.684267	-0.6828225247311905	Alternating exposures requested	N	N
[mm] SIM defocus	0	0.001444936568705701	[s] Primary exposure time	0.000000	1.8
[mm] SIM translation stage pos	-190.132523	-190.1400660498719			
[mm] SIM translation stage offset	0	0.00754346686406393			
Phase constraints	Y	Y			
[d] Phase period	5.599829	5.599829			
[d] Phase epoch (MJD)	55560.205900	55560.205900			
Phase start	0.300000	0.300000			
Phase end	0.700000	0.700000			
Phase start error	0.100000	0.100000			
Phase end error	0.100000	0.100000			
[s] Observation start time (MET)	413276265.184000	413274901.35515			
Observation start date	2011-02-05T06:56:39	2011-02-05T06:35:01			
[s] Observation end time (MET)	413288265.184000	413289494.2809			
Observation end date	2011-02-05T10:16:39	2011-02-05T10:38:14			
Read mode	TIMED	TIMED			

2.3 Aspect



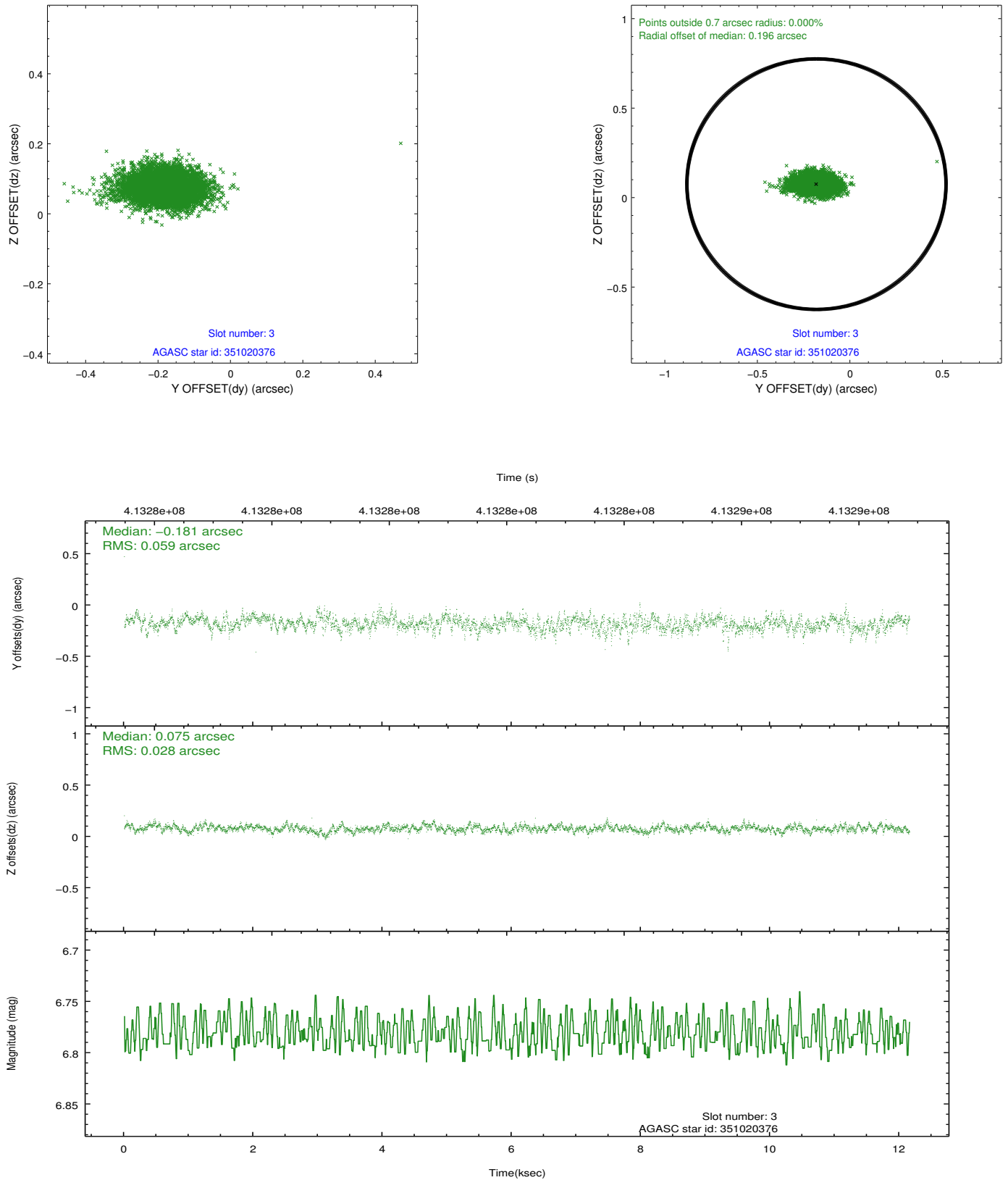


Slot Statistics

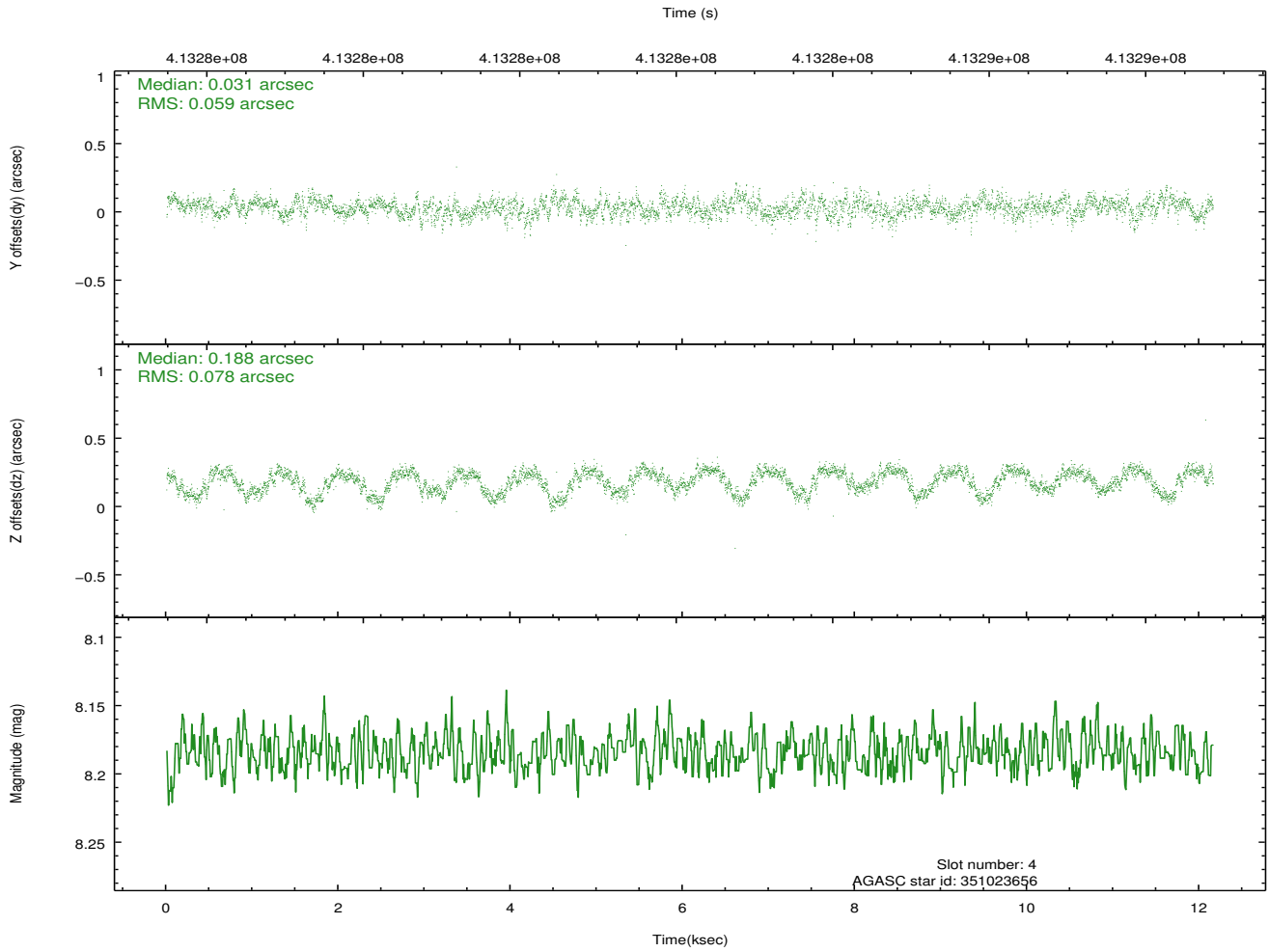
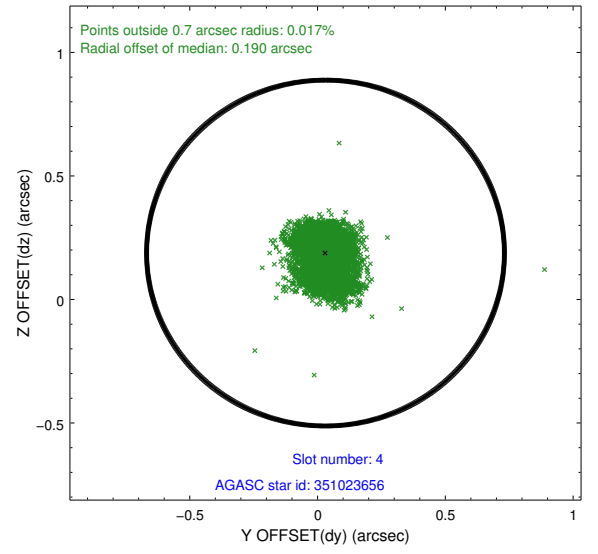
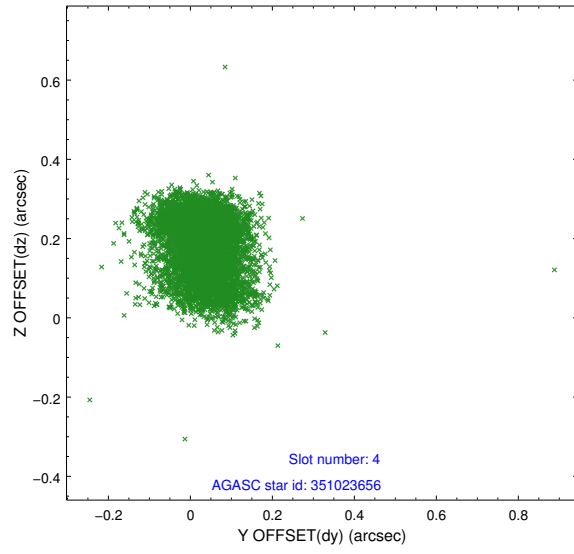
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-1	7.00	2966	0.067	-0.001	0.029	0.055	0.000000	0.000000	924.53	-1735.49
1	FID	ACIS-S-4	7.00	2965	0.141	-0.023	0.011	0.019	0.000000	0.000000	2142.25	168.23
2	FID	ACIS-S-5	7.04	2965	-0.234	0.039	0.025	0.036	0.000000	0.000000	-1824.11	162.37
3	GUIDE	351020376	6.78	5931	-0.181	0.075	0.065	0.117	299.982490	35.296494	1265.62	-80.40
4	GUIDE	351023656	8.19	5927	0.031	0.188	0.103	0.162	299.727900	34.661972	-295.03	-1909.23
5	GUIDE	350889584	8.50	5927	0.159	0.005	0.081	0.133	299.222293	35.536921	-465.16	1570.51
6	GUIDE	351014072	8.33	5929	0.003	0.101	0.079	0.133	299.502600	34.724591	-825.84	-1446.29
7	GUIDE	351406096	8.90	5917	-0.006	-0.360	0.109	0.174	299.076637	35.711249	-616.86	2313.37

2.4 Star Slots

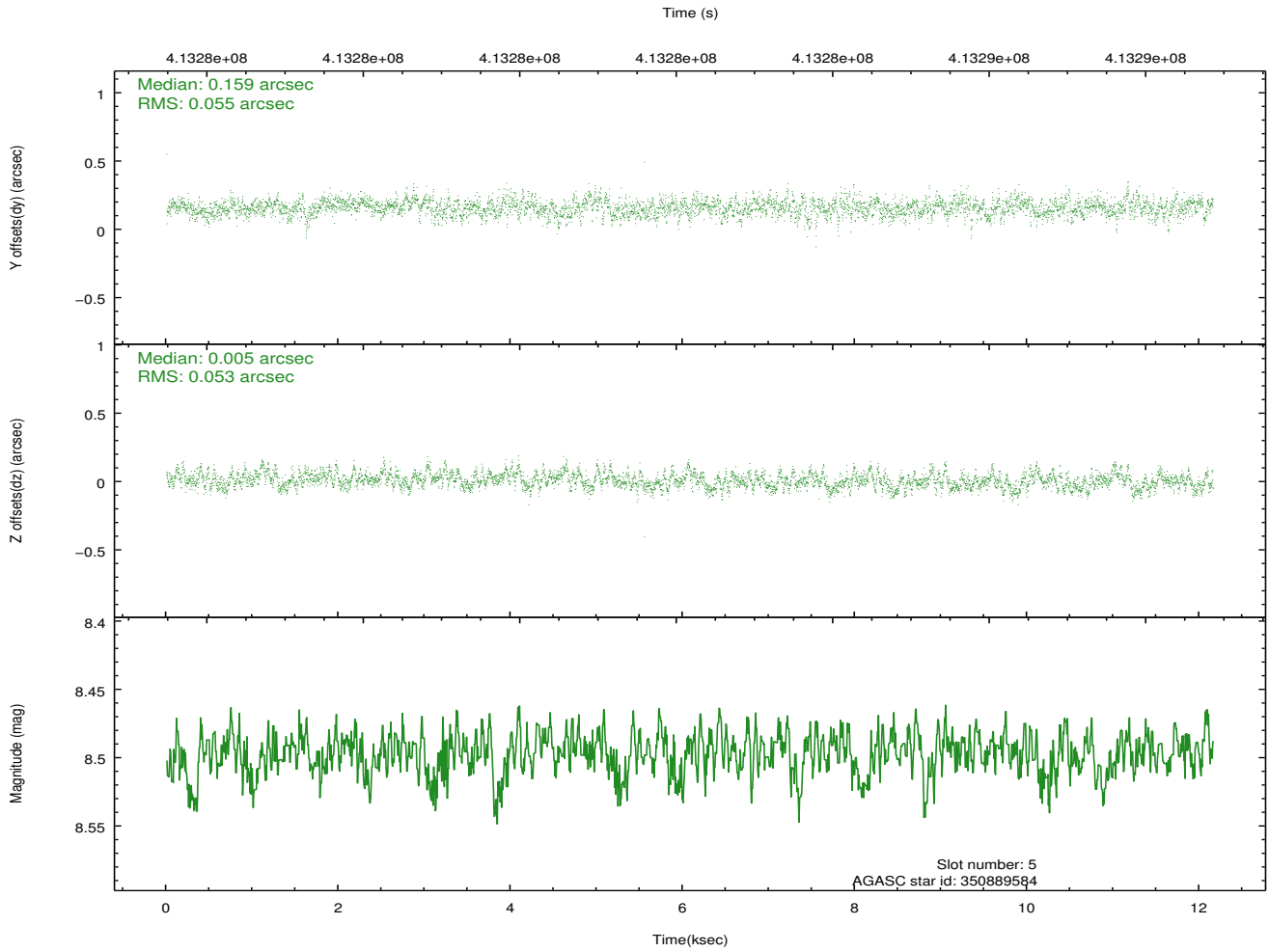
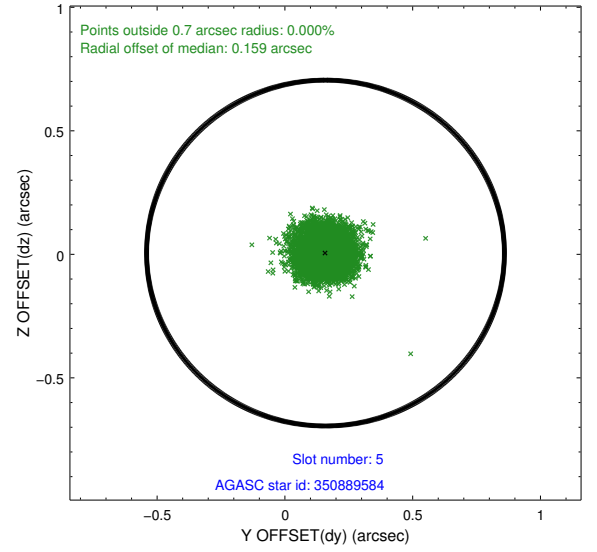
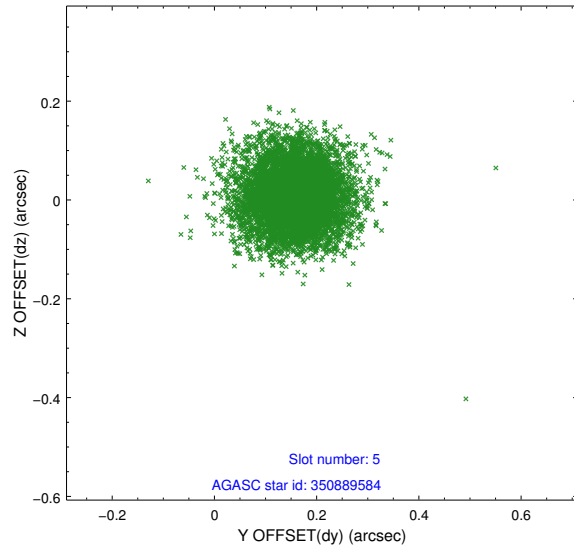
2.4.1 Slot 3



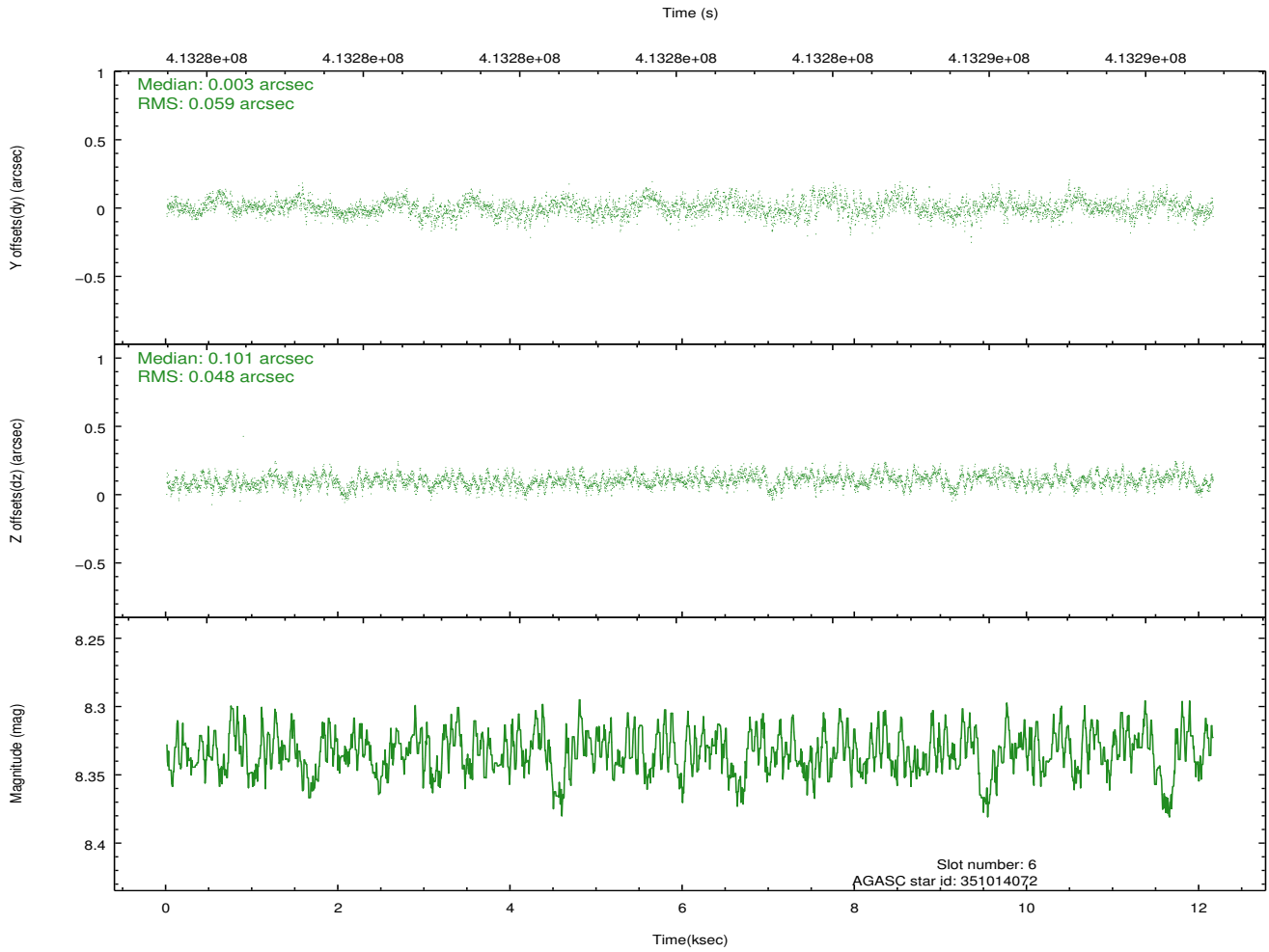
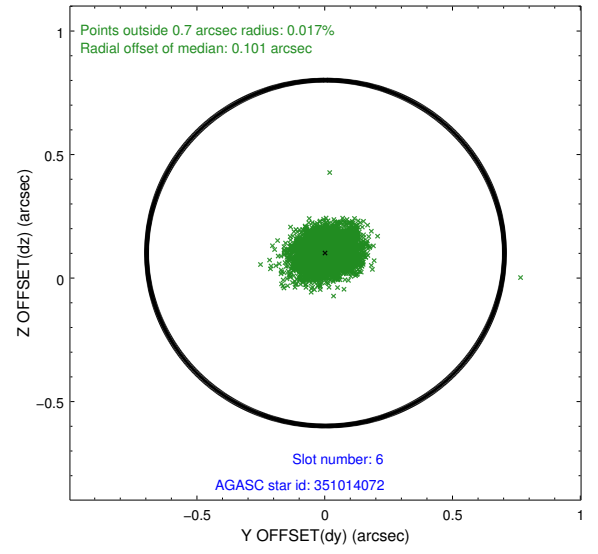
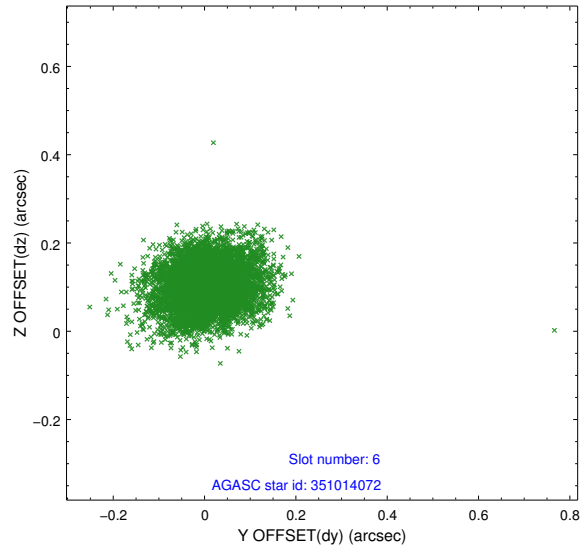
2.4.2 Slot 4



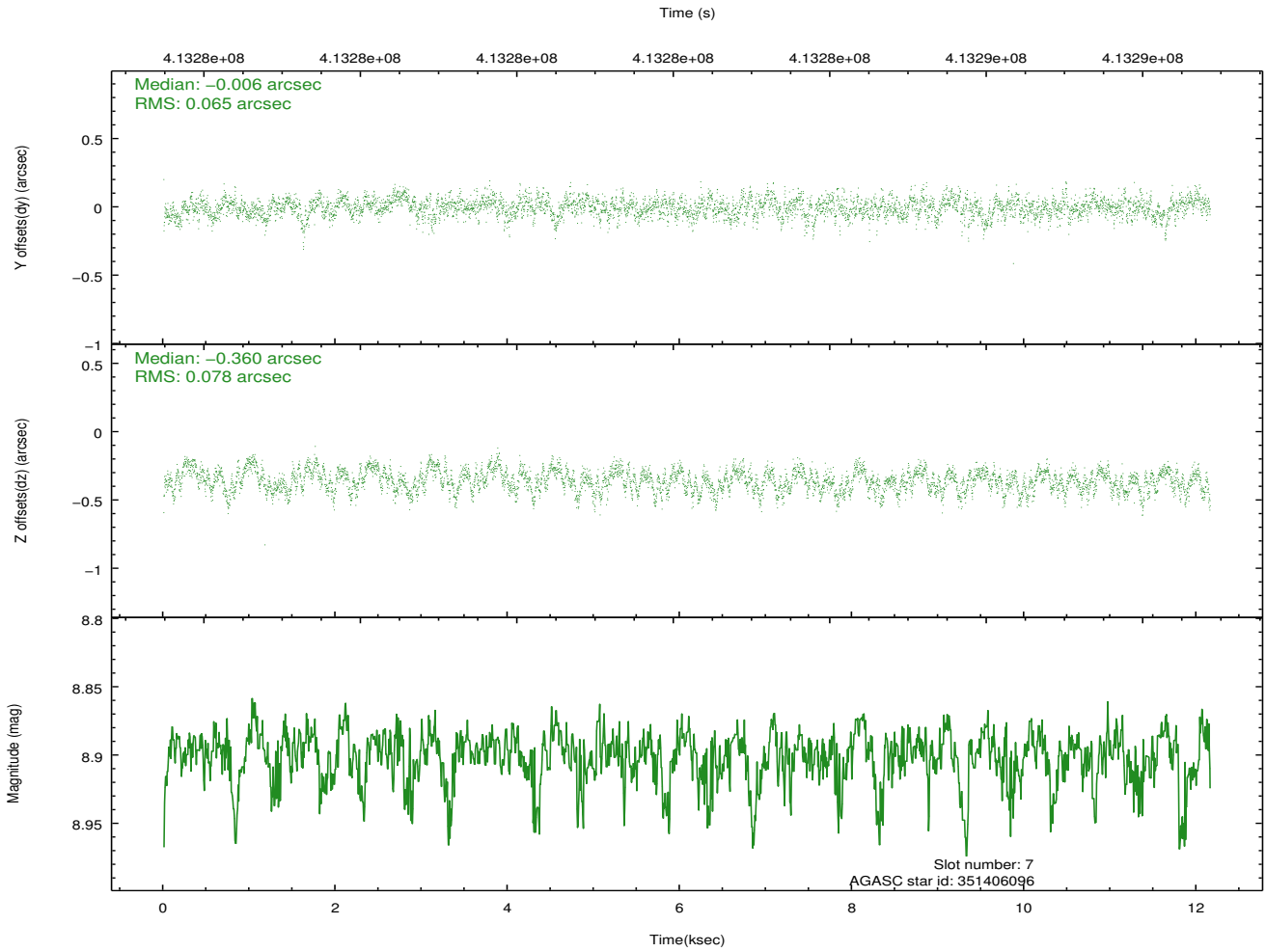
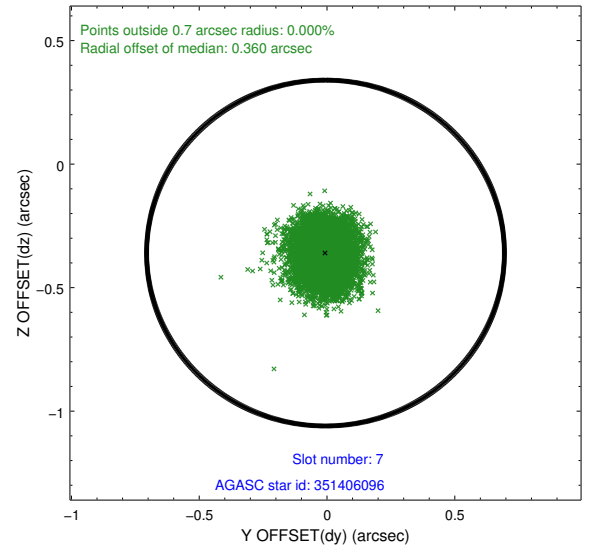
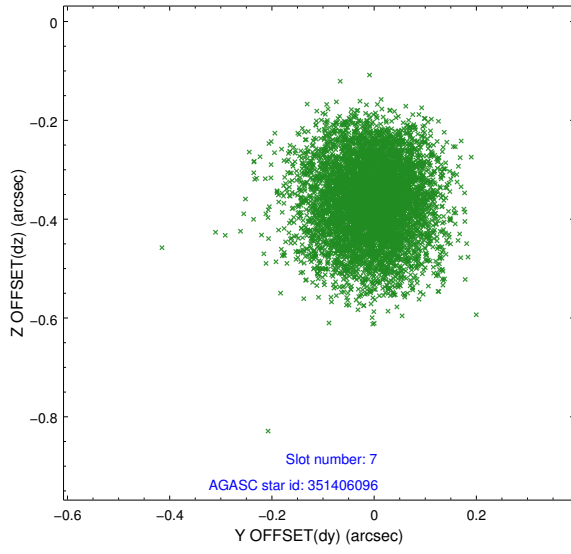
2.4.3 Slot 5



2.4.4 Slot 6

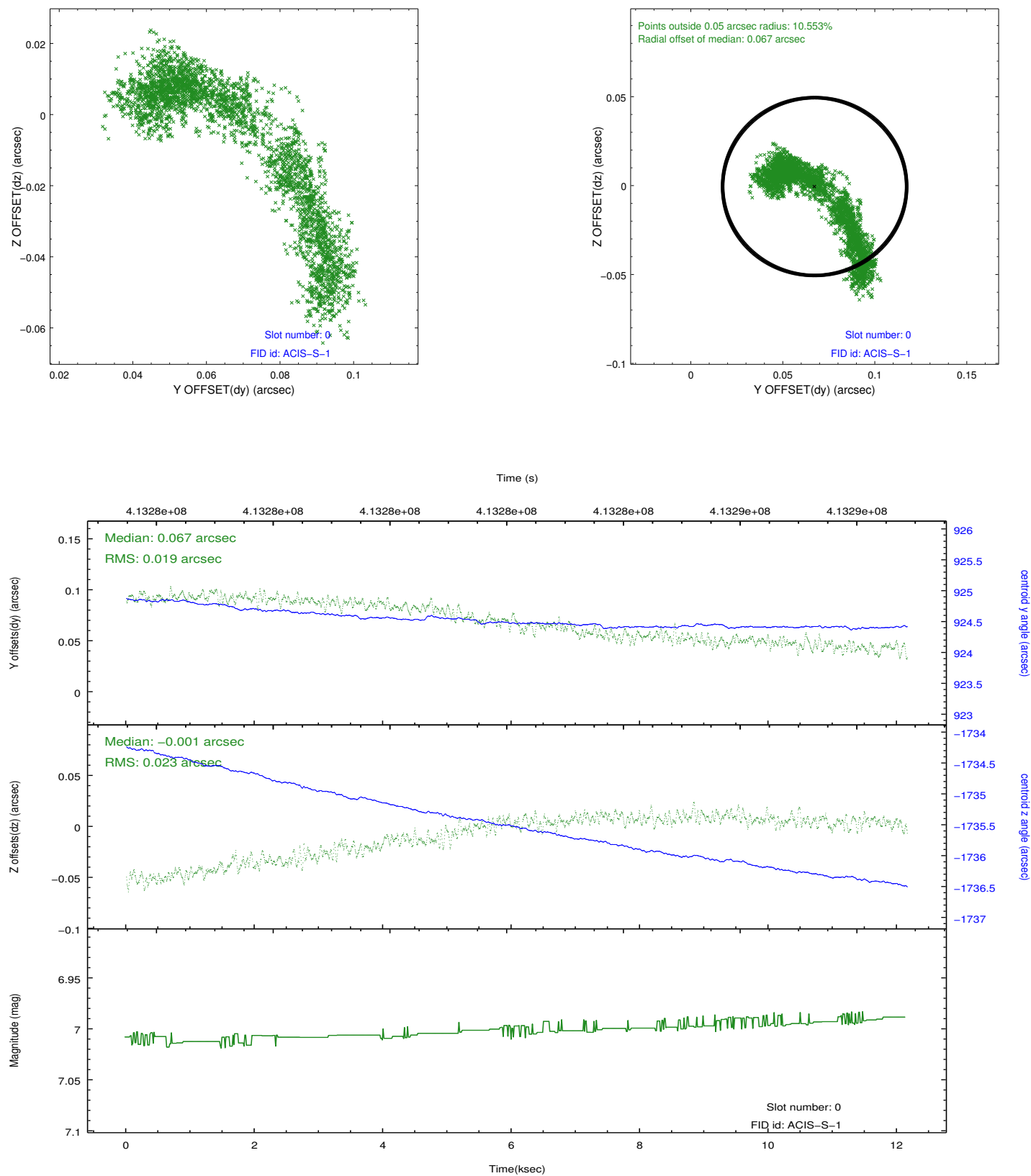


2.4.5 Slot 7

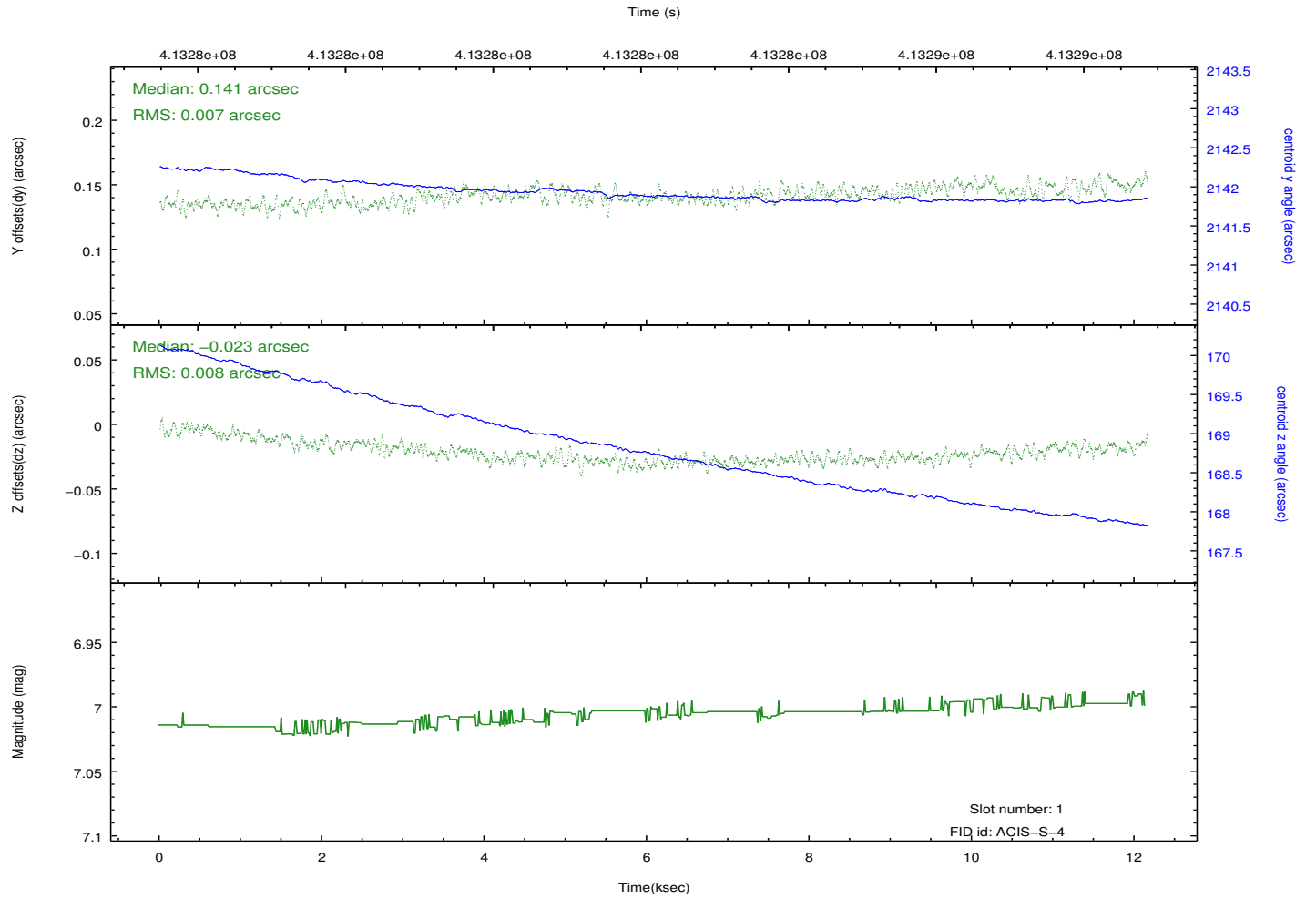
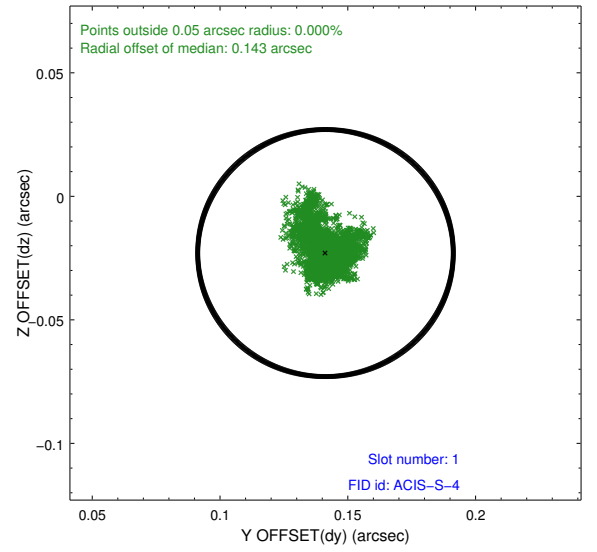
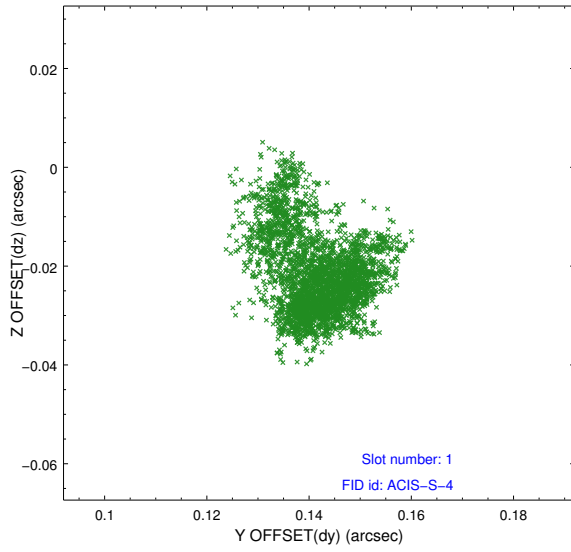


2.5 FID Slots

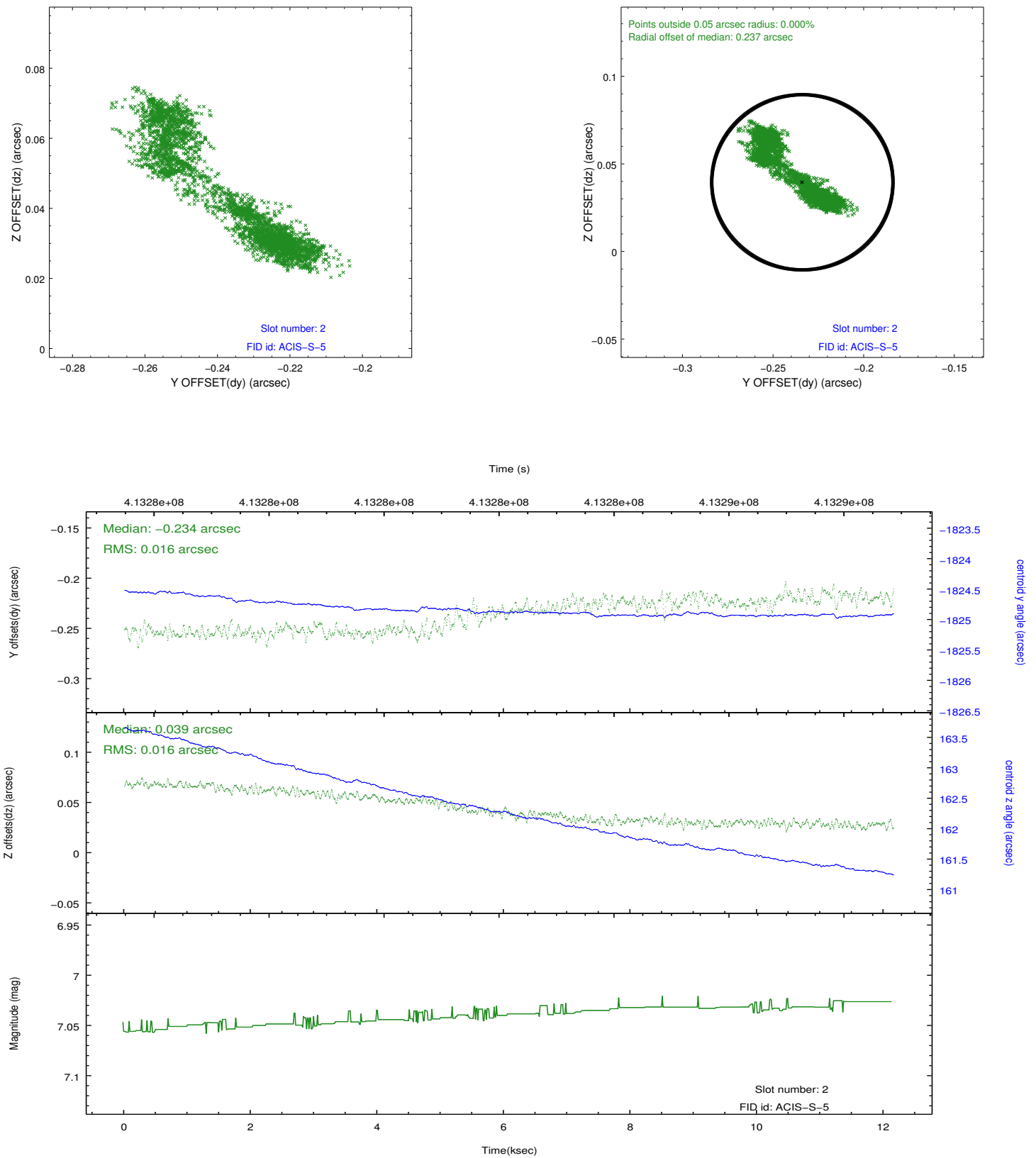
2.5.1 Slot 0



2.5.2 Slot 1

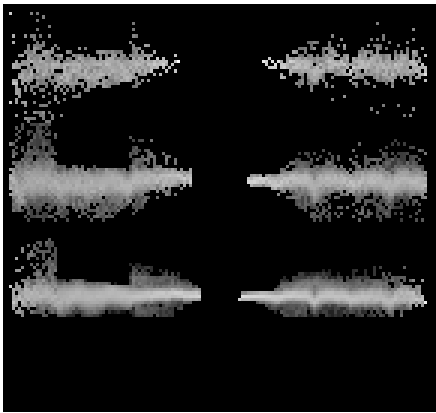


2.5.3 Slot 2

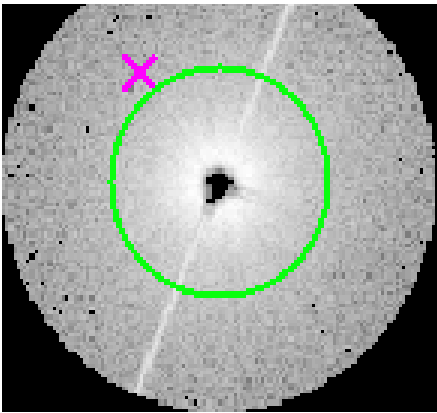


3 Gratings

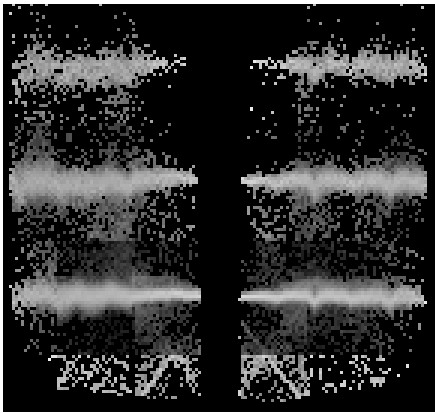
3.1 HEG Arm



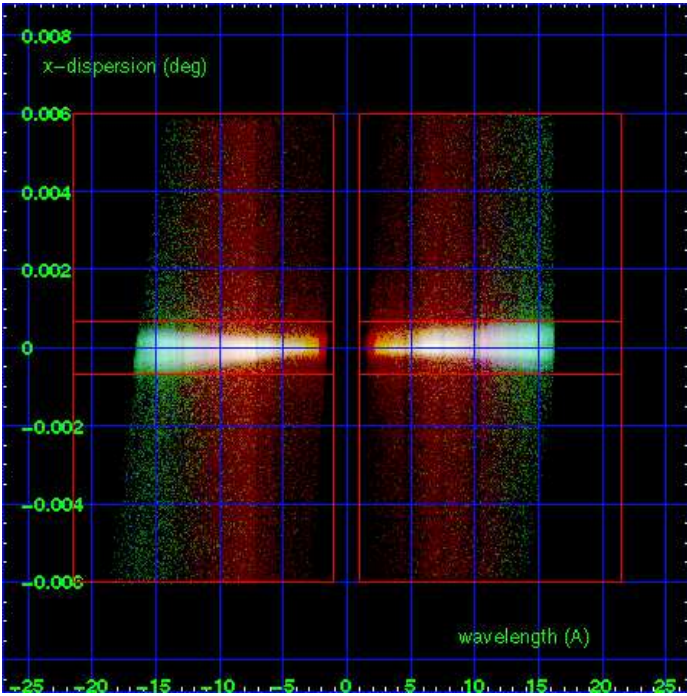
HEG Order Sort 123



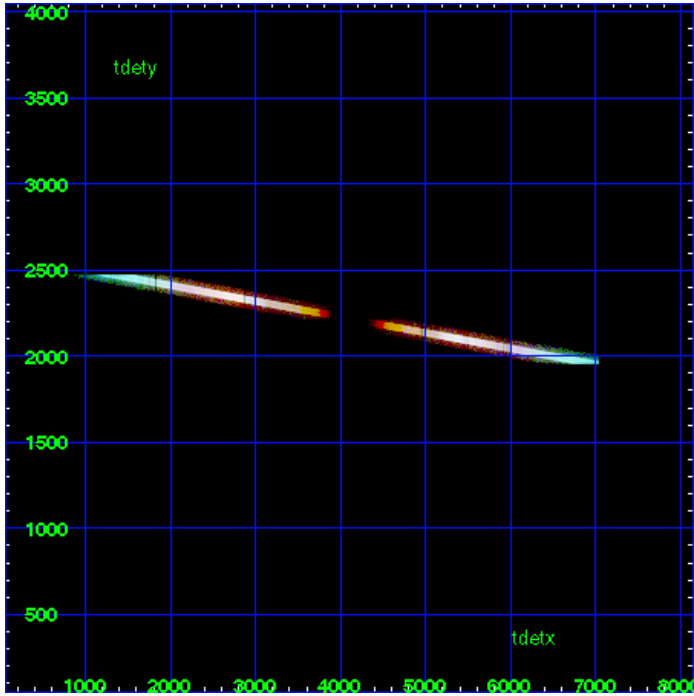
HEG Zero Order



HEG Order Sort ALL

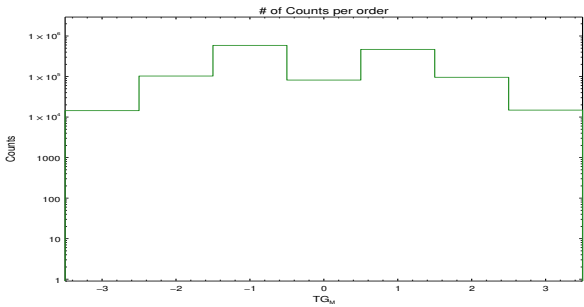


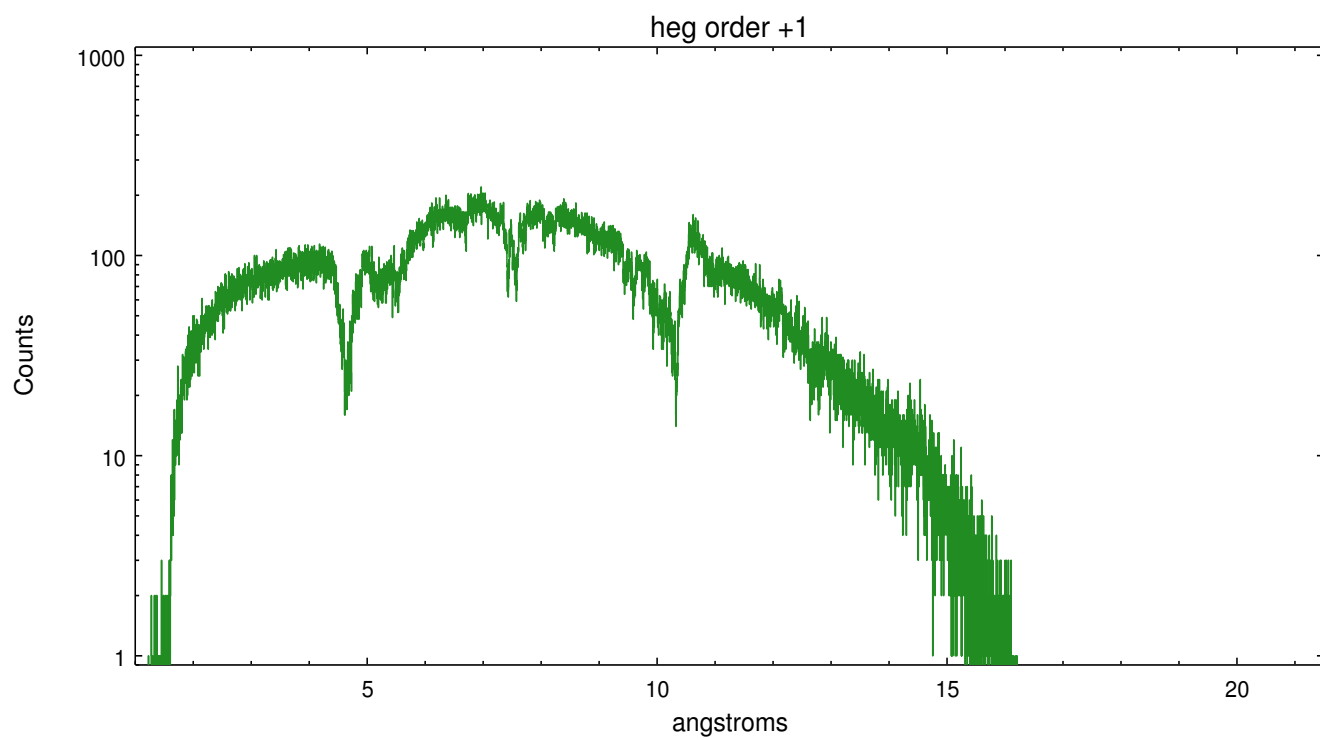
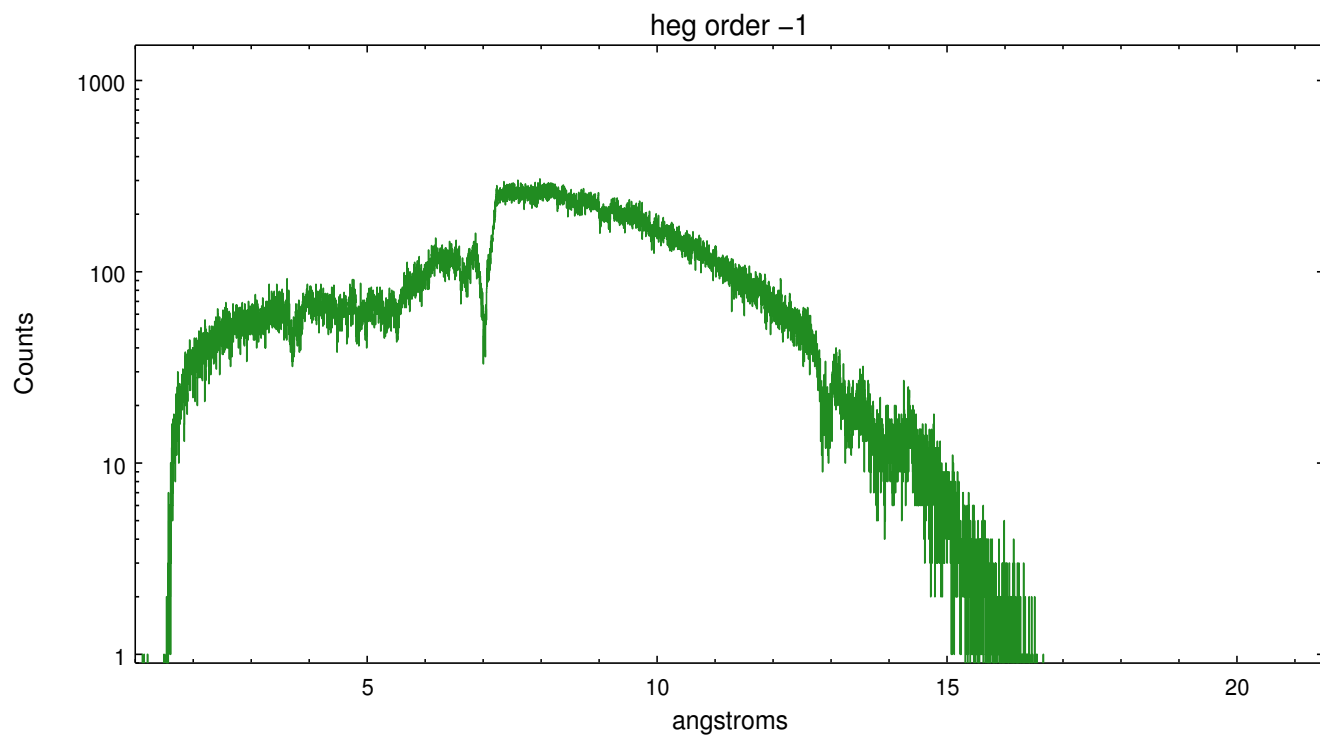
Spot Image HEG



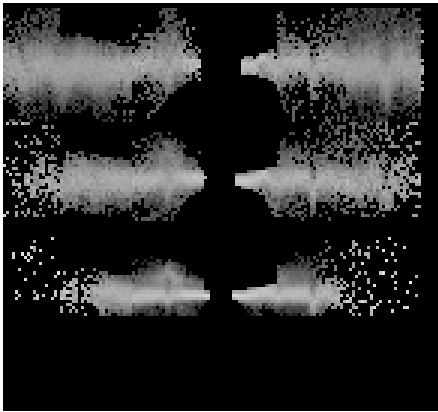
Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	14400	102867	587076	81777	467538	95771	14841

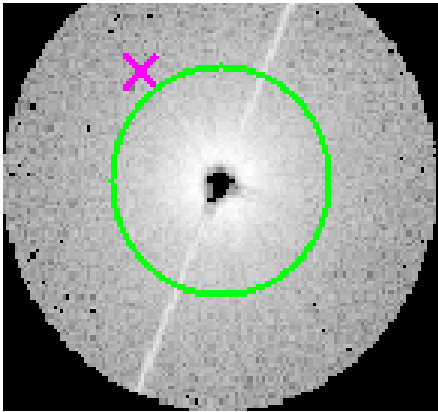




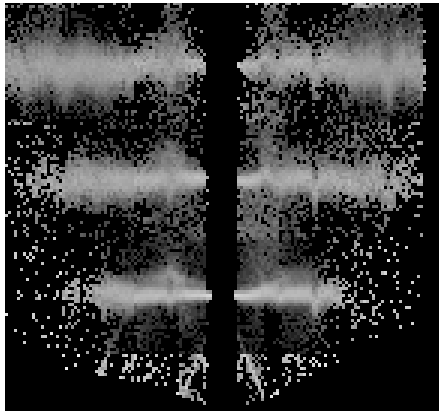
3.2 MEG Arm



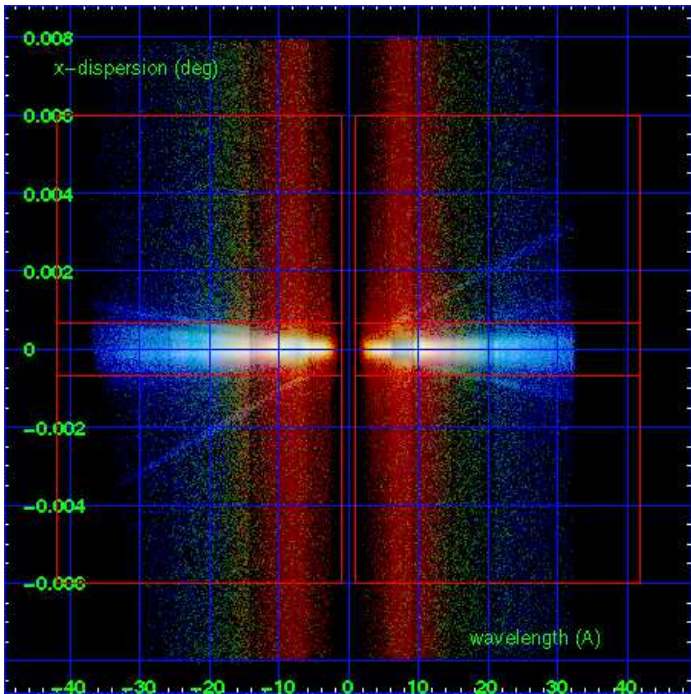
MEG Order Sort 123



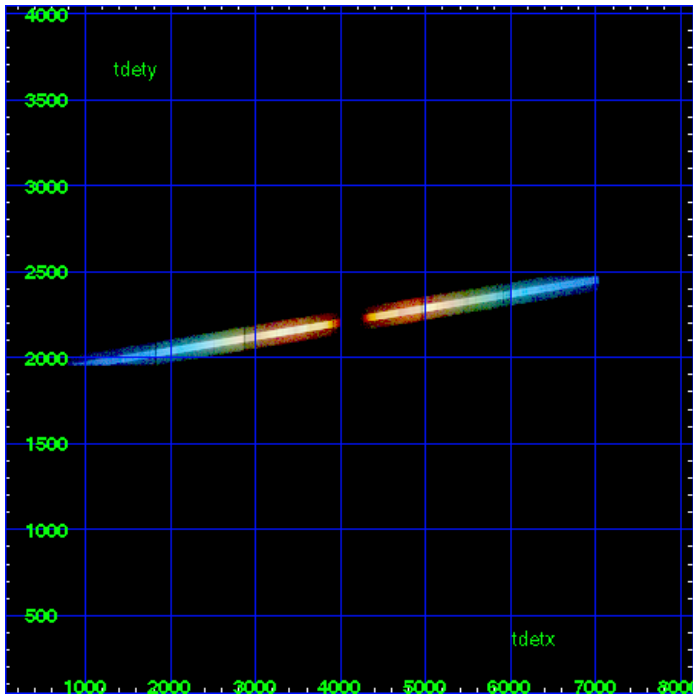
MEG Zero Order



MEG Order Sort ALL

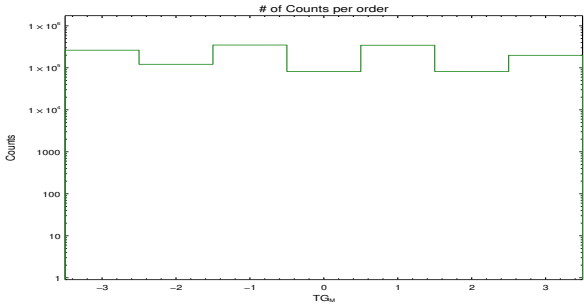


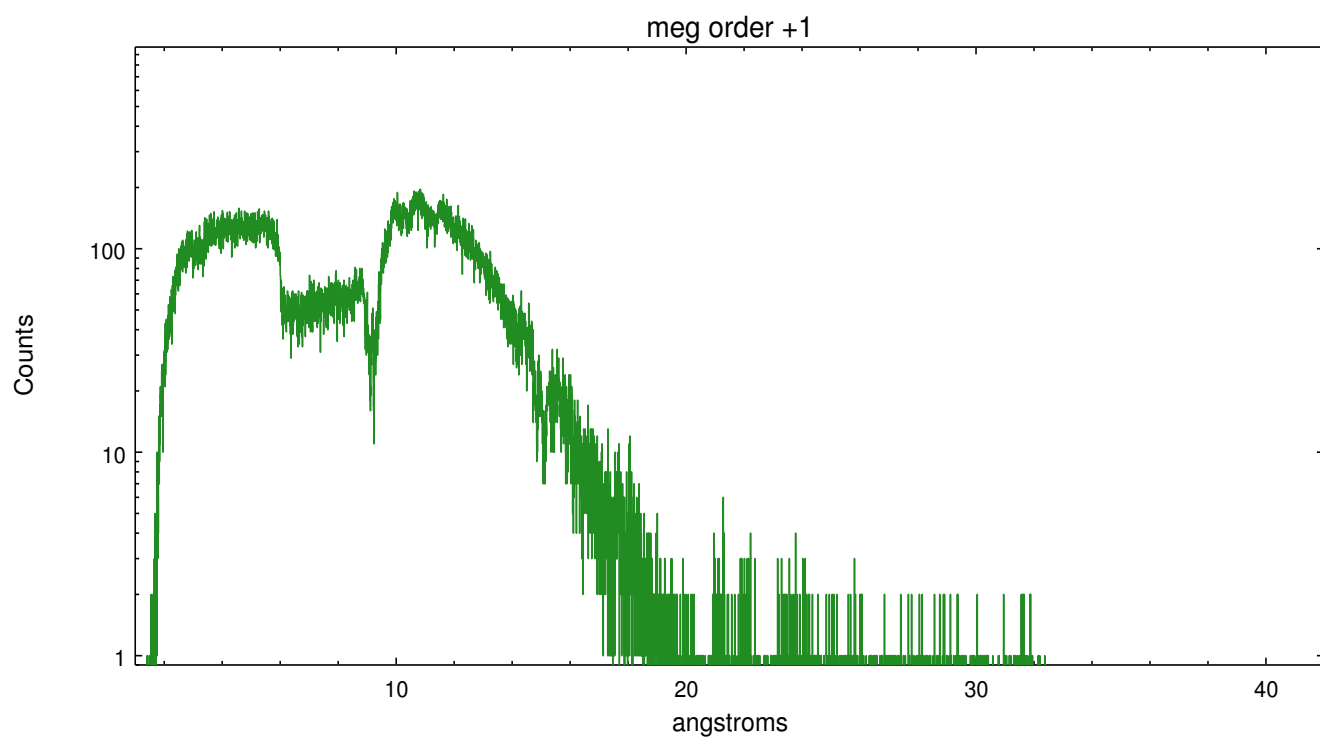
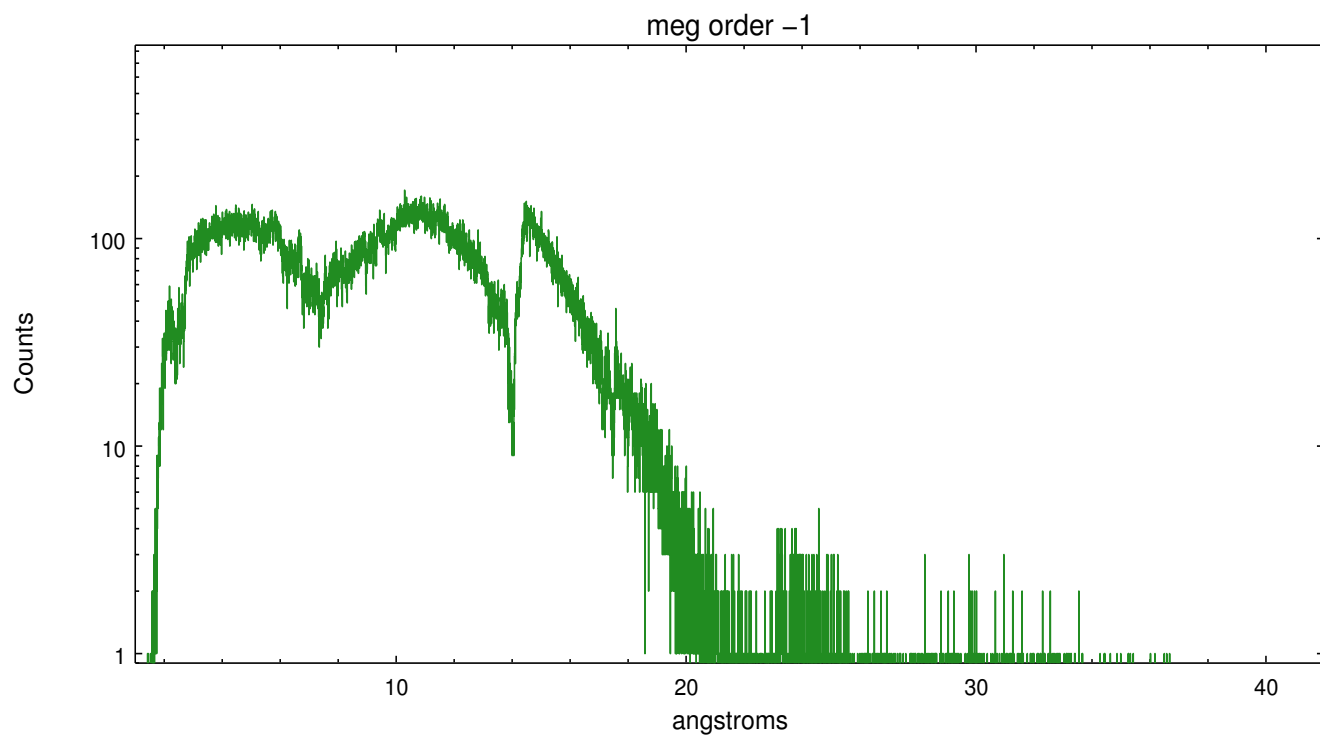
Spot Image MEG



Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	262728	121144	348796	81777	344717	81843	198377





A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2012.02.15
V&V Edition	2
V&V Disposition and Status	OK
V&V Charge Time	12

A.2 Comments

Due to significant telemetry saturation, the effective exposure time is substantially less than the duration of the observation and varies from chip-to-chip. This is expected for bright sources. Charge time is the same as scheduled time. ONTIME calculation is based on CCD chip 7, where the zeroth order is located. ===== Zeroth order (and spectral arms) piled up. Standard data processing software did not correctly locate the zeroth order due to pileup. Manual intervention was used during this processing to input the correct sky coordinates (x=4117.79, y=4066.89) into the *src1a.fits file table. These corrected coordinates were determined using a software tool developed by CXC called findzero (currently in ISIS). The tool calculates the point of intersection of the readout streak and the meg arm. Note that these corrected coordinates of the zeroth order cannot be reproduced by running tgdetect on the data. =====

The data for this observation have been processed using the 'EDSER' sub-pixel event-repositioning algorithm of Li et al. (2004, ApJ, 610, 1204). Small-scale features should become sharper for sources near the aim point. The improvement will be less noticeable for off-axis sources where the size of the point-spread function is comparable to or larger than the size of an ACIS pixel. To take full advantage of the improvement, images should be binned on spatial scales smaller than the size of an ACIS pixel. Note that, at present, the point-spread function has not been calibrated for data to which the EDSER algorithm has been applied. If dither was disabled for the observation, then the algorithm can introduce artificial aliasing effects on spatial scales smaller than a pixel. If you would prefer to use no sub-pixel adjustment or to apply a coordinate randomization, then use `acis_process_events` to reprocess the data with the parameter `pix_adj=NONE` or `RANDOMIZE`, respectively.