

V&V Reference Report

L2 ASCDS Version : 10

Observation 14654 - L2 Version 3
Chandra X-Ray Center

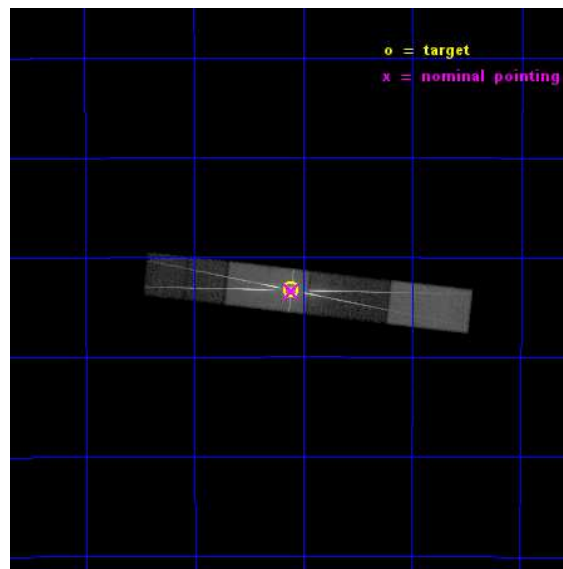
L2 Processing Date : Dec 4 2014

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1 Front

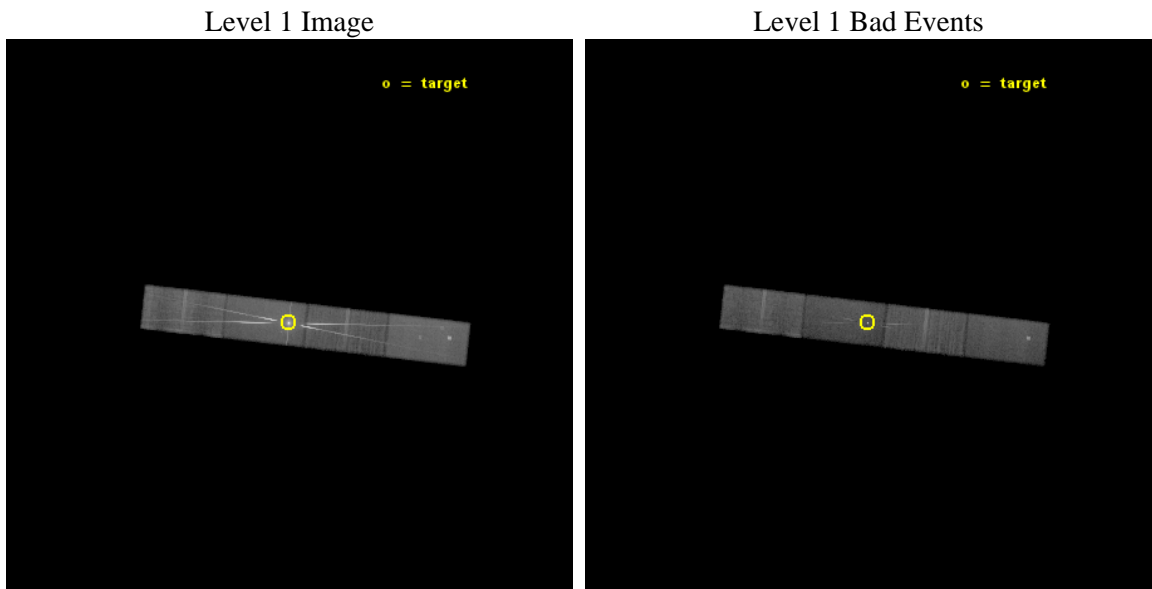
seq_num	401487	Sequence number
obs_id	14654	Observation id
title	X-raying the Stellar Wind and Atmosphere of Vela X-1	Proposal titl
observer	Prof. Masao Sako	Principal investigator
object	Vela X-1	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	135.52875	Observer's specified target RA [deg]
dec_targ	-40.554694	Observer's specified target Dec [deg]
ra_nom	135.52699284383	Nominal RA [deg]
dec_nom	-40.557412577912	Nominal Dec [deg]
roll_nom	186.39874629833	Nominal Roll [deg]
revision	3	Processing version of data
ontime	47057.600701213	Sum of GTIs [s]
livetime	45880.759227039	Livetime [s]
ontime5	47057.600701213	Sum of GTIs [s]
ontime6	47057.600701213	Sum of GTIs [s]
ontime7	47057.600701213	Sum of GTIs [s]
ontime8	47057.600701213	Sum of GTIs [s]
l2events	450610	Number of level 2 events



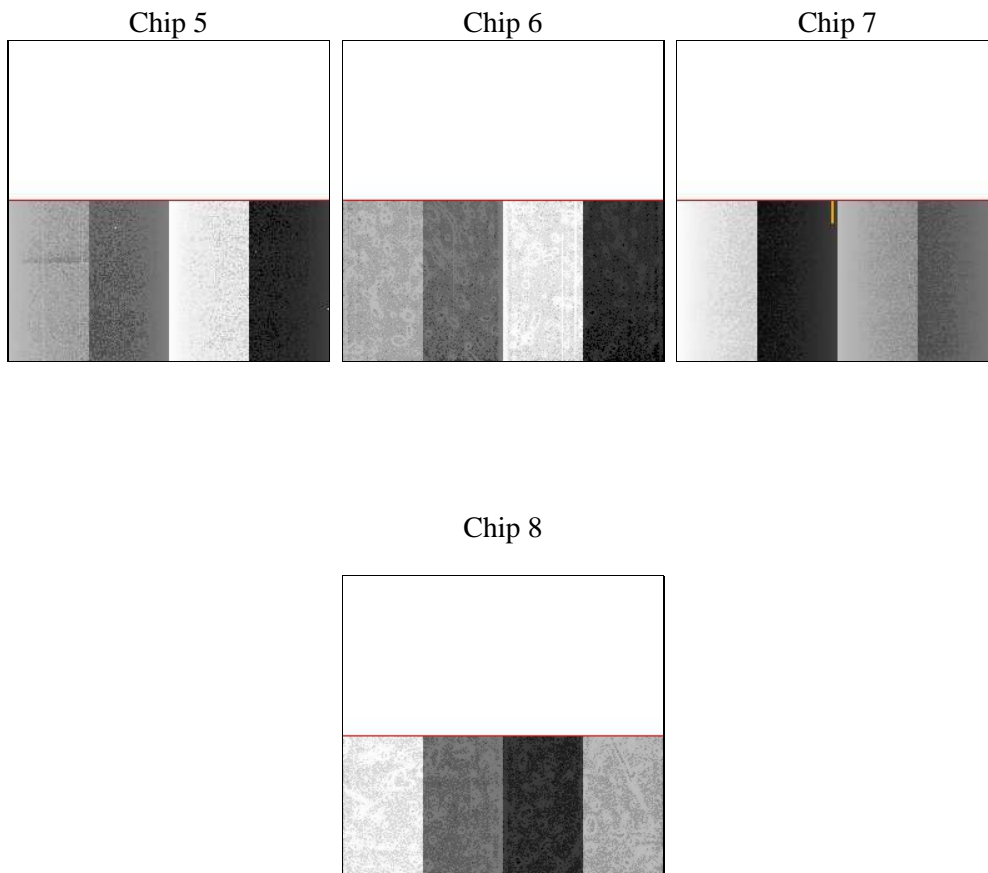
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	47000.000000	[s] Scheduled observation exposure time
ascdsver	10.3	Processing system revision	ontime	47057.600701213	Sum of GTIs [s]
caldbver	4.6.4	 	ontime5	47057.600701213	Sum of GTIs [s]
date	2014-12-04T22:53:10	Date and time of file creation	ontime6	47057.600701213	Sum of GTIs [s]
revision	2	Processing version of data	ontime7	47057.600701213	Sum of GTIs [s]
			ontime8	47057.600701213	Sum of GTIs [s]
			l1events	922728	Number of level 1 events
			tgmethod	FINDZO	Method used to create src1a file
			zo_pos	(4088.91, 4116.18)	src1a sky pixel position
			zo_pos_tgd	(4088.52, 4117.08)	src1a sky pixel position via todetect

2.1.4 Events

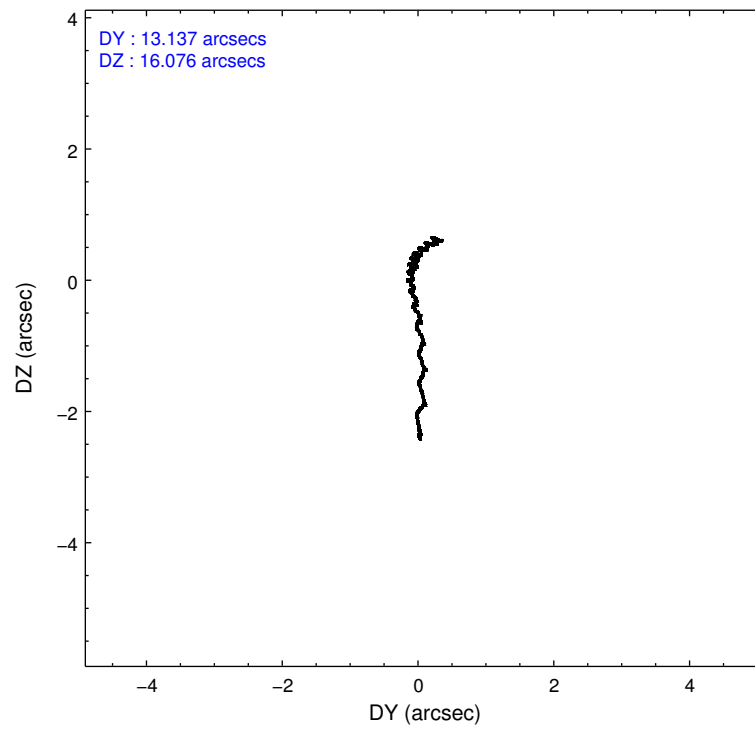
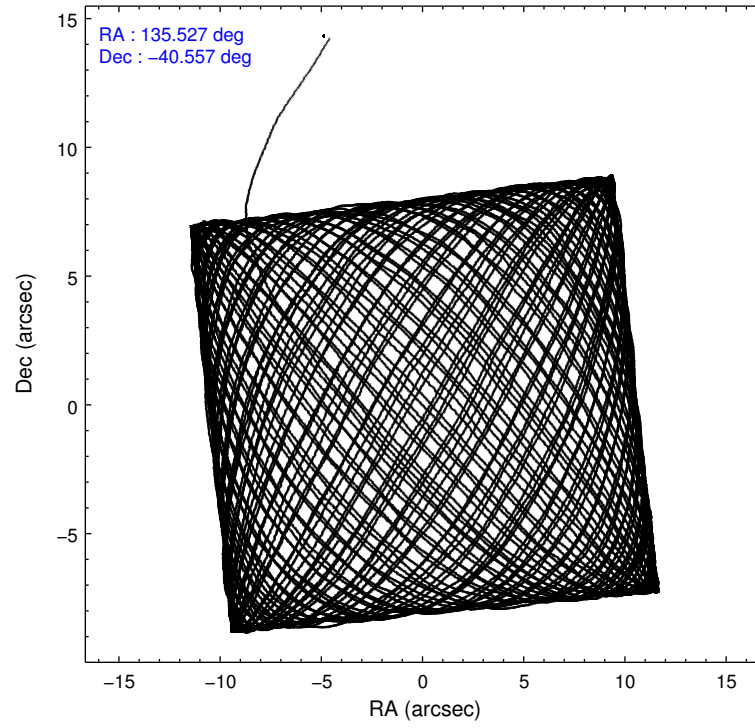
	ccd 5	ccd 6	ccd 7	ccd 8
level 1 events	201644	220488	327325	173271
rejected events	100902	112495	94865	119328
rejected %	50%	51%	28%	68%

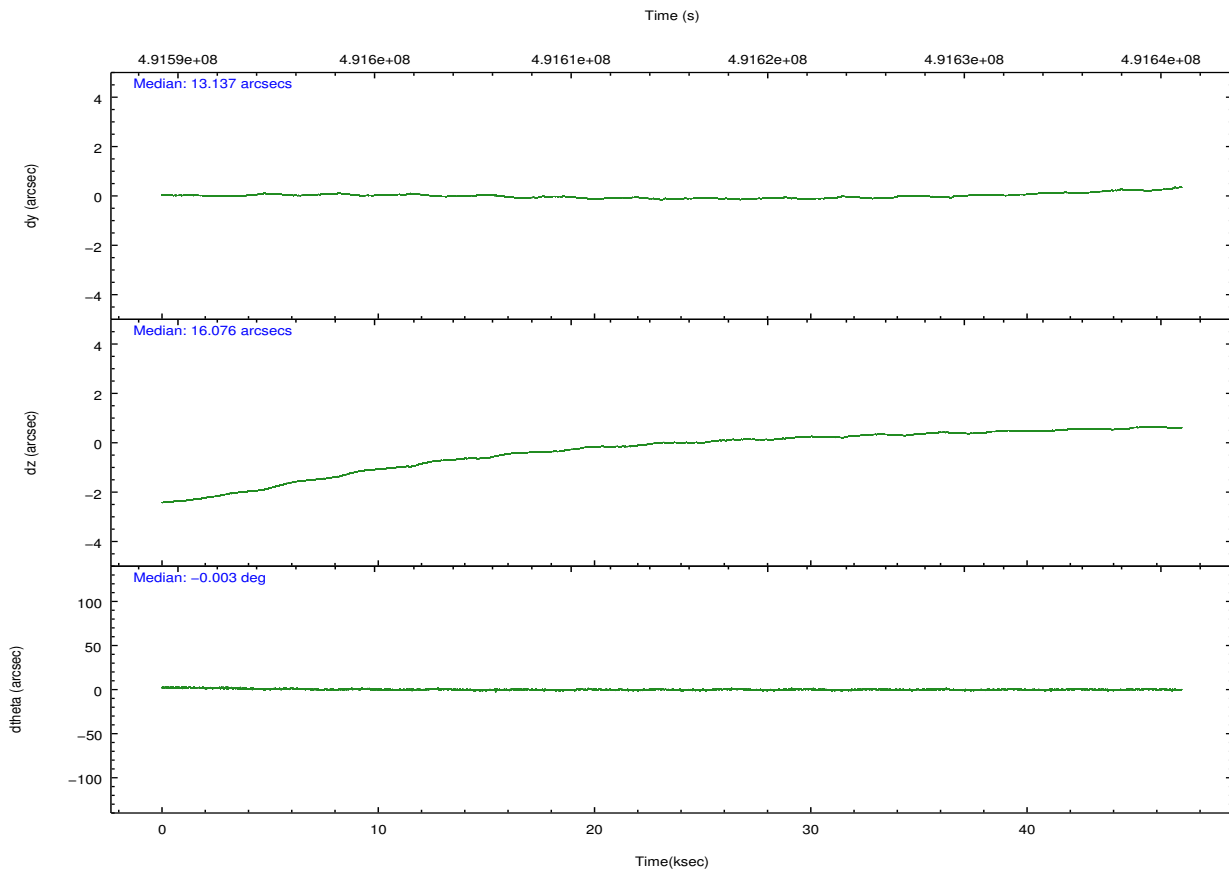
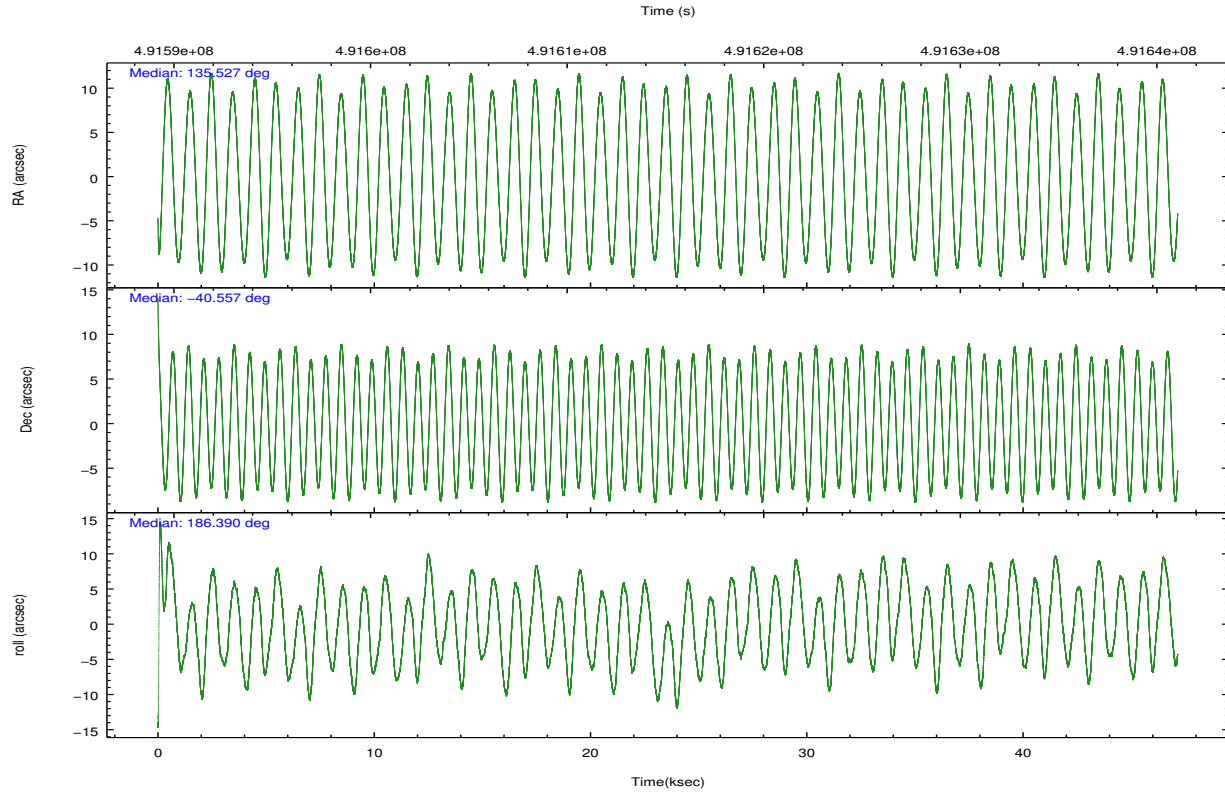
	ccd 5	ccd 6	ccd 7	ccd 8
grade 0 events	11568	58557	41712	18726
	5%	26%	12%	10%
grade 1 events	2817	337	1115	108
	1%	0%	0%	0%
grade 2 events	28595	18899	51150	11684
	14%	8%	15%	6%
grade 3 events	5261	7085	22204	5289
	2%	3%	6%	3%
grade 4 events	5235	7189	22218	5087
	2%	3%	6%	2%
grade 5 events	16078	6295	19742	8311
	7%	2%	6%	4%
grade 6 events	50087	16265	95191	13160
	24%	7%	29%	7%
grade 7 events	82003	105861	73993	110906
	40%	48%	22%	64%

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	Number of optional ACIS chips dropped	0	0
Observation mode	POINTING	POINTING	On-chip summing requested	N	N
[deg] Pointing RA	135.555666	135.526992843829	Subarray requested	CUSTOM	1/2
[deg] Pointing Dec	-40.540878	-40.55741257791229	Subarray start row	1	1
[deg] Pointing Roll	186.260765	186.3987462983347	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	1.6
[mm] SIM translation stage pos	-183.992523	-183.9875365069546			
[mm] SIM translation stage offset	-6.14	-6.144986076053243			
Phase constraints	Y	Y			
[d] Phase period	8.964416	8.964416			
[d] Phase epoch (MJD)	55663.552000	55663.552000			
Phase start	0.720000	0.720000			
Phase end	0.780000	0.780000			
Phase start error	0.030000	0.030000			
Phase end error	0.030000	0.030000			
[s] Observation start time (MET)	491591701.184000	491590447.61479			
Observation start date	2013-07-30T17:13:54	2013-07-30T16:54:07			
[s] Observation end time (MET)	491638701.184000	491639252.47995			
Observation end date	2013-07-31T06:17:14	2013-07-31T06:27:32			
Read mode	TIMED	TIMED			

2.3 Aspect



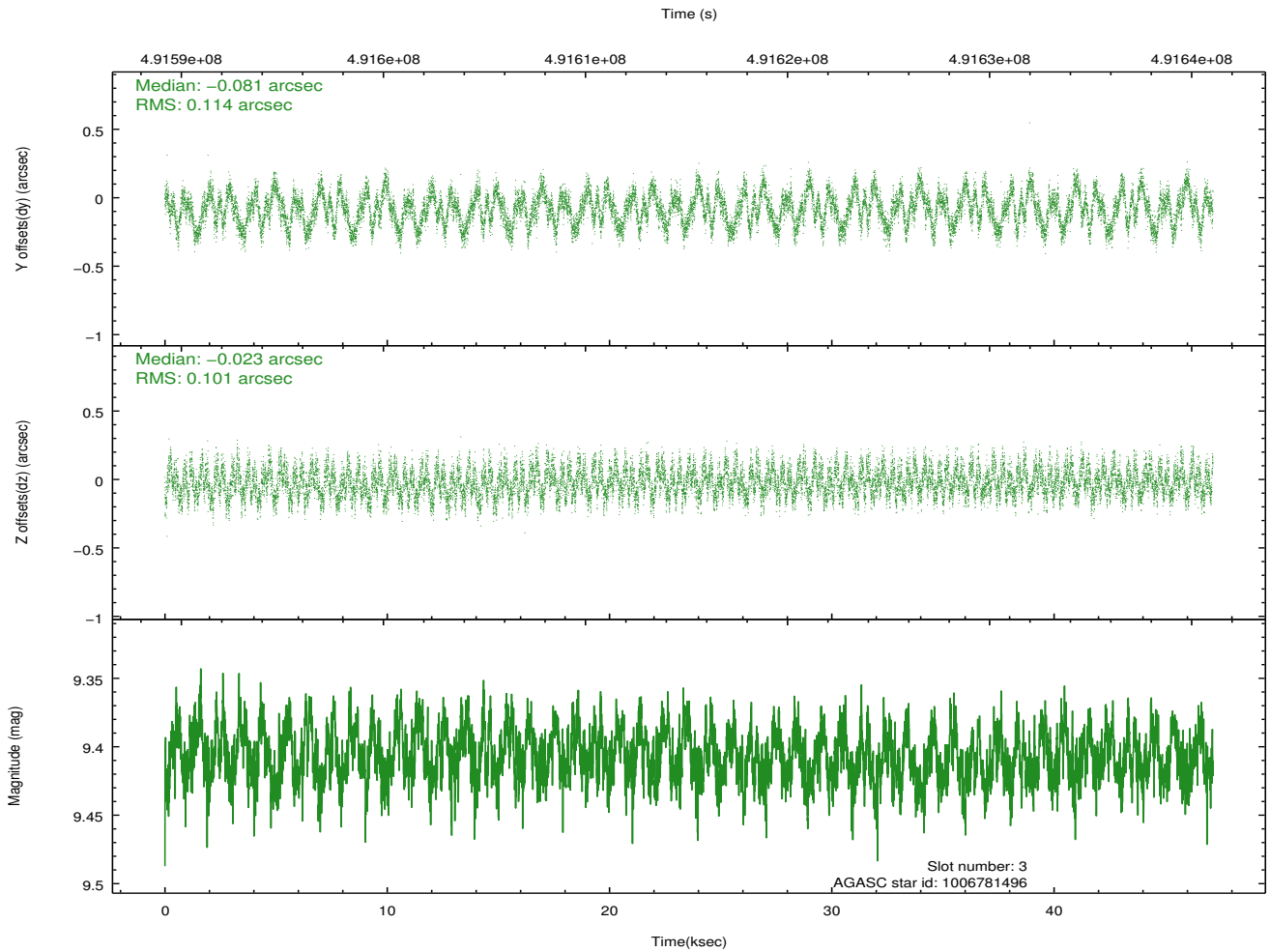
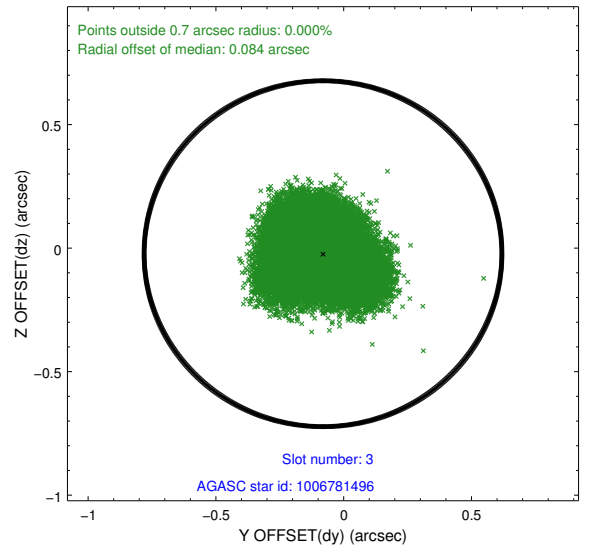
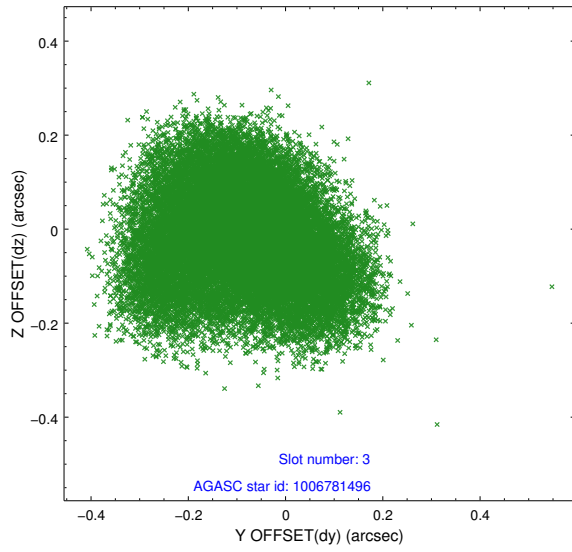


Slot Statistics

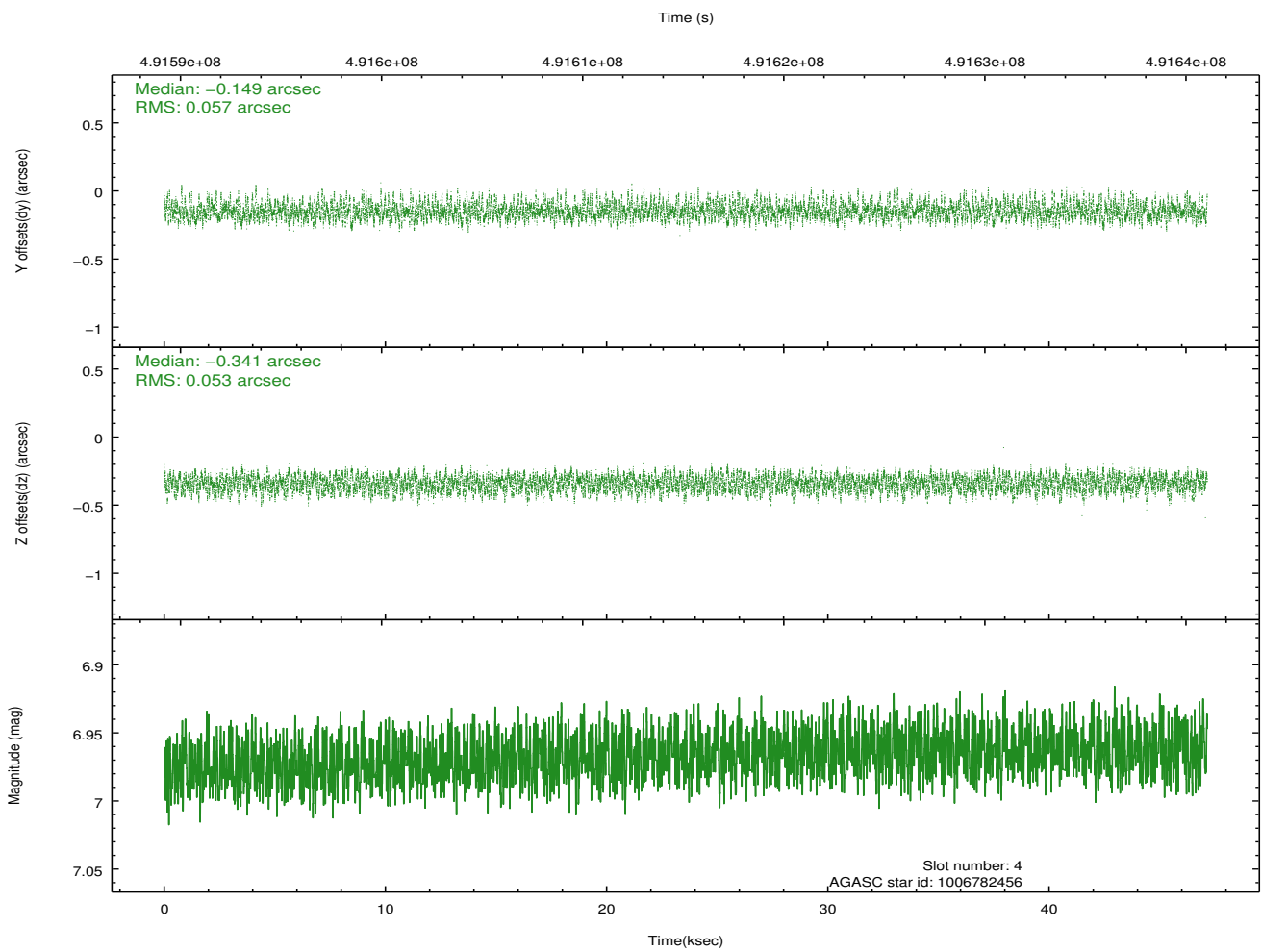
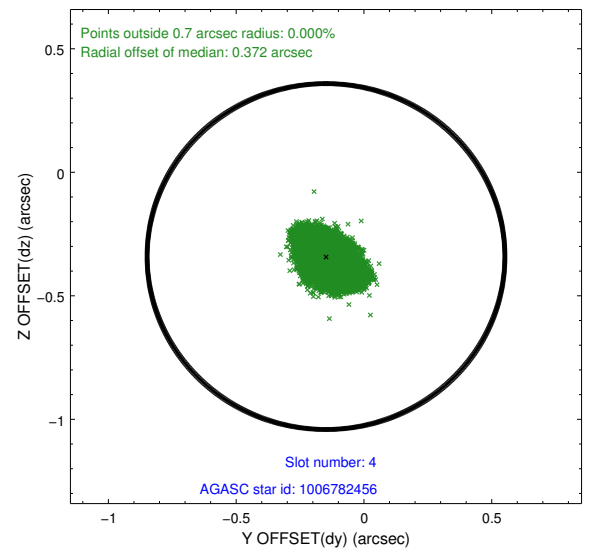
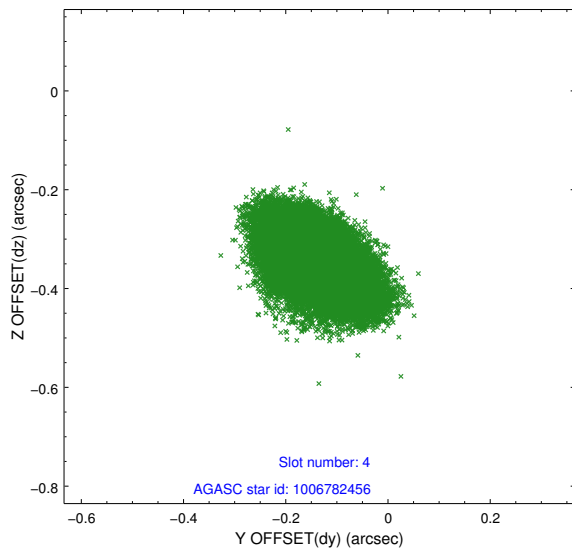
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-S-2	6.96	11501	-0.148	-0.100	0.008	0.016	0.000000	0.000000	-765.81	-1863.88
1	FID		ACIS-S-4	7.03	11499	0.142	0.087	0.008	0.013	0.000000	0.000000	2147.79	44.72
2	FID		ACIS-S-6	7.24	11500	-0.021	0.020	0.012	0.021	0.000000	0.000000	396.33	682.08
3	GUIDE	used	1006781496	9.41	22983	-0.081	-0.023	0.169	0.251	135.176515	-41.032939	1216.85	1651.01
4	GUIDE	used	1006782456	6.97	23001	-0.149	-0.341	0.082	0.136	135.528583	-40.554696	79.18	41.20
5	GUIDE	used	1006784024	9.64	22884	0.184	0.046	0.128	0.206	135.140125	-40.518811	1122.54	-200.00
6	GUIDE	used	1006784656	9.56	22956	0.019	0.122	0.160	0.251	135.212791	-39.922706	698.99	-2312.80
7	GUIDE	used	1006774288	9.41	22833	0.031	0.194	0.121	0.194	136.151715	-40.161117	-1778.23	-1174.66

2.4 Star Slots

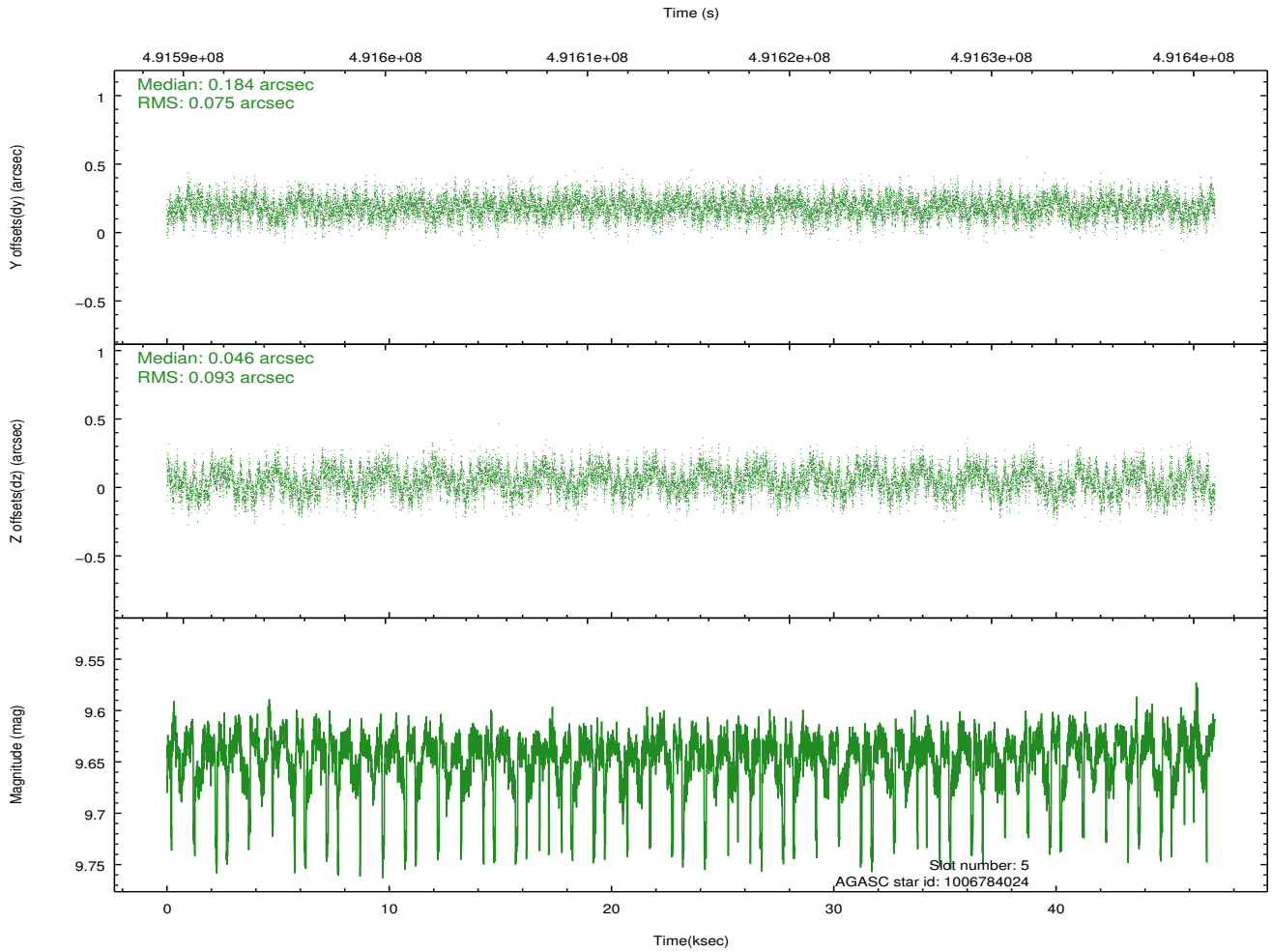
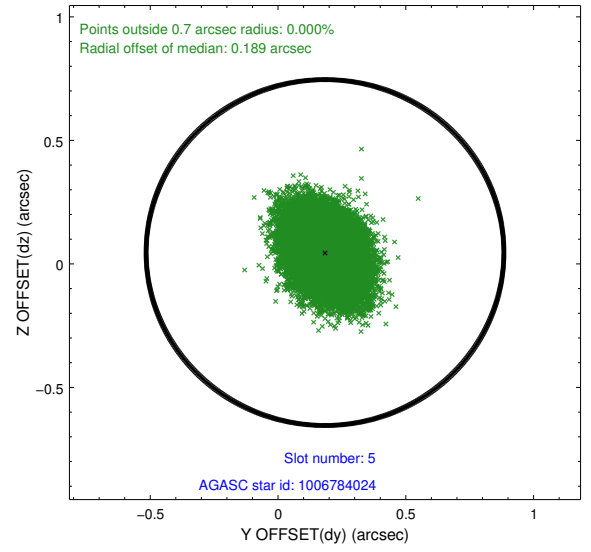
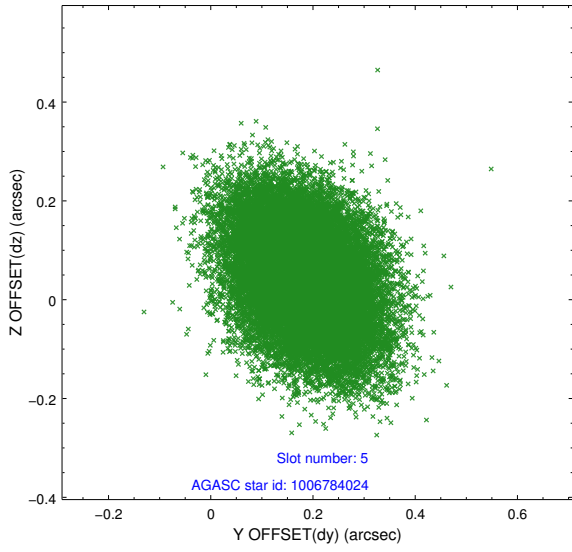
2.4.1 Slot 3



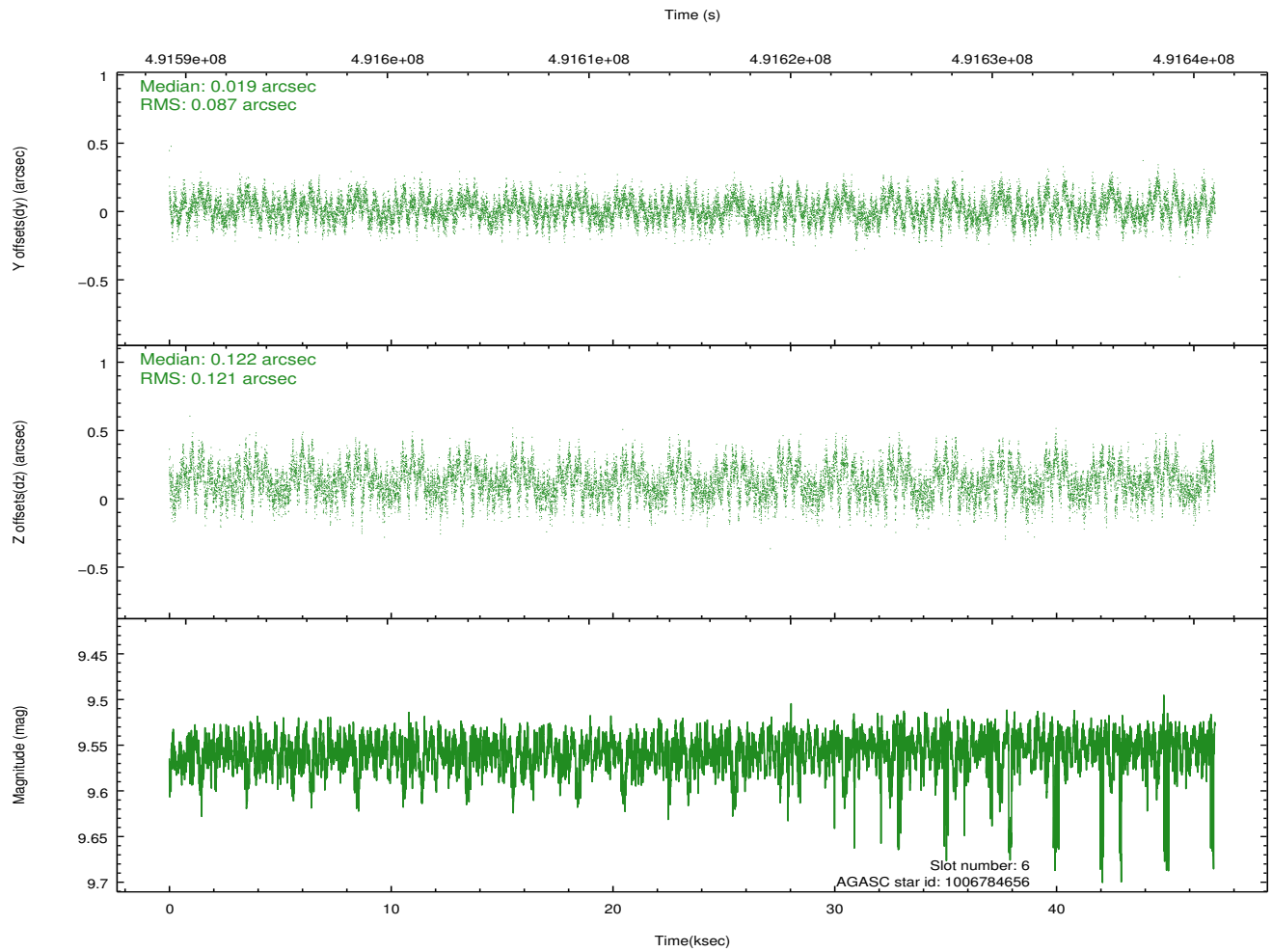
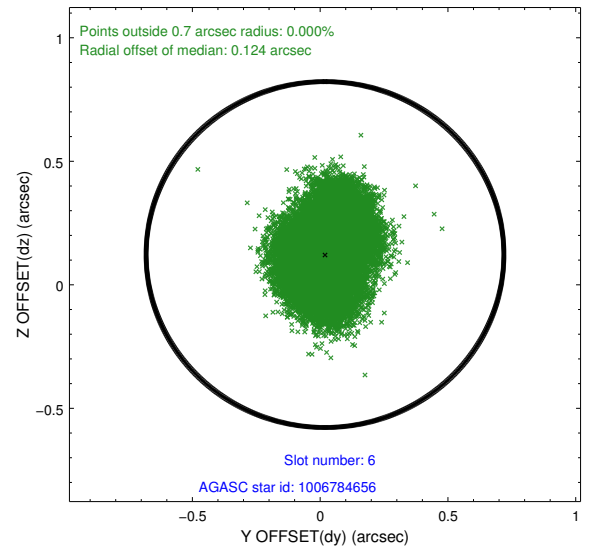
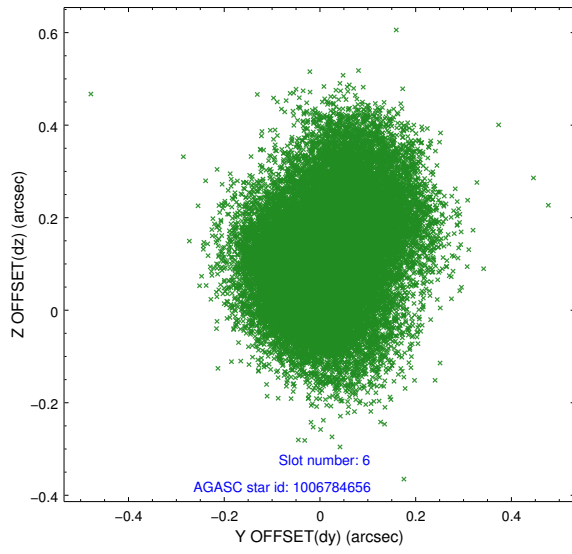
2.4.2 Slot 4



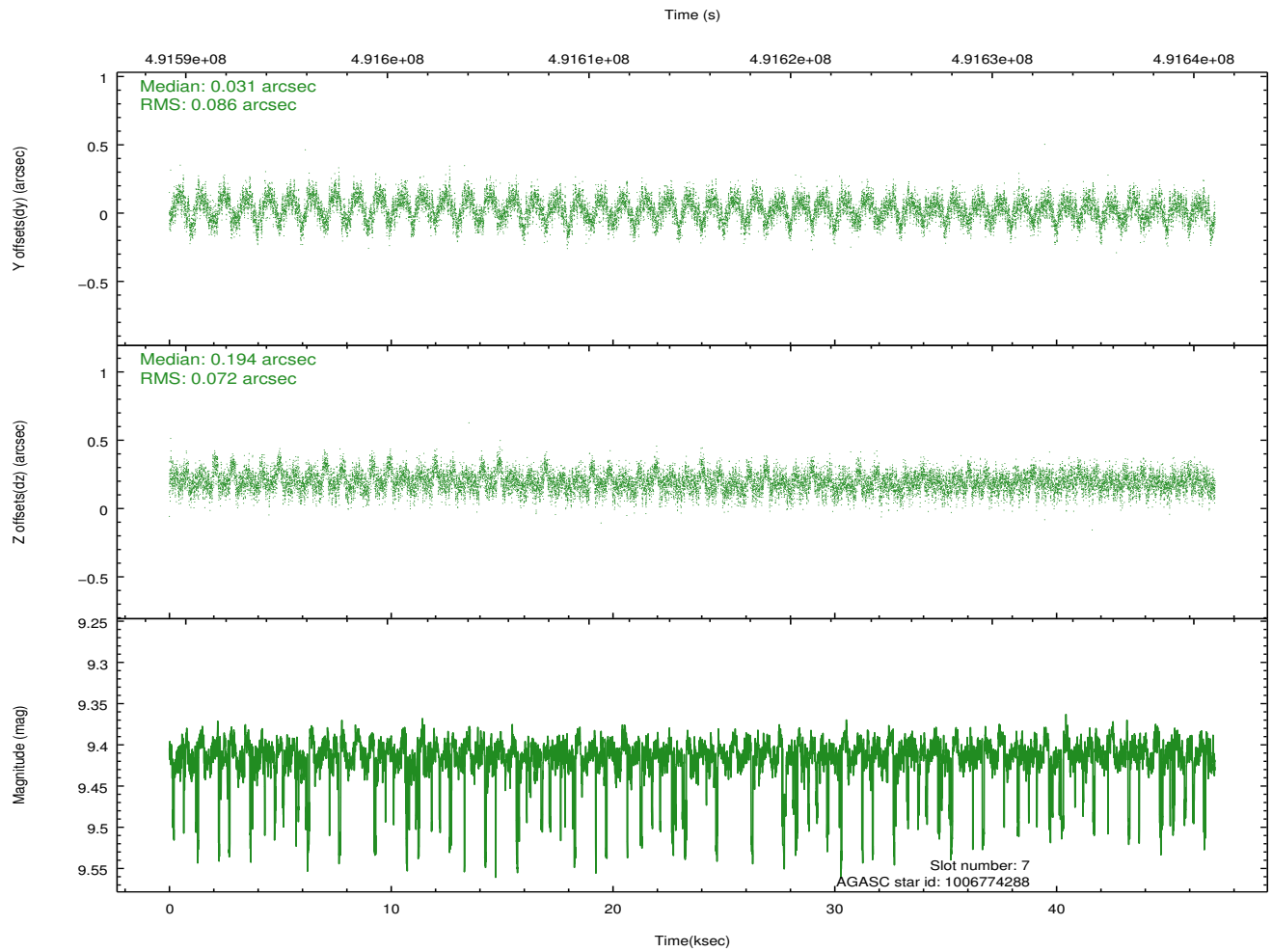
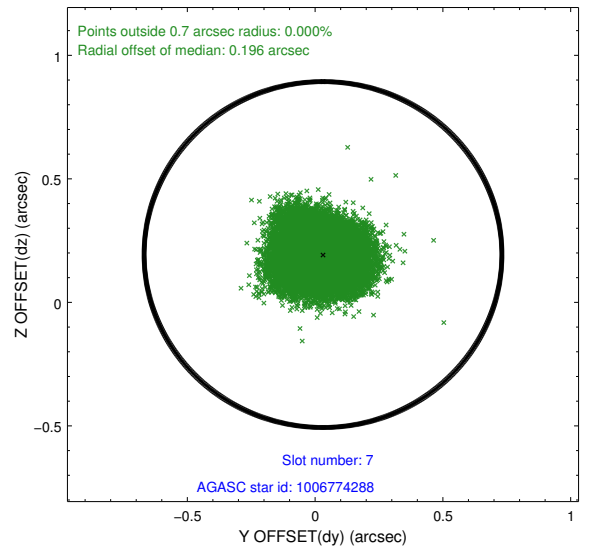
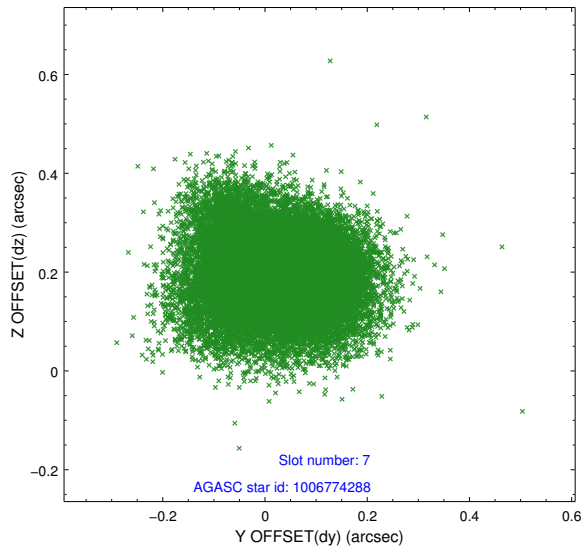
2.4.3 Slot 5



2.4.4 Slot 6

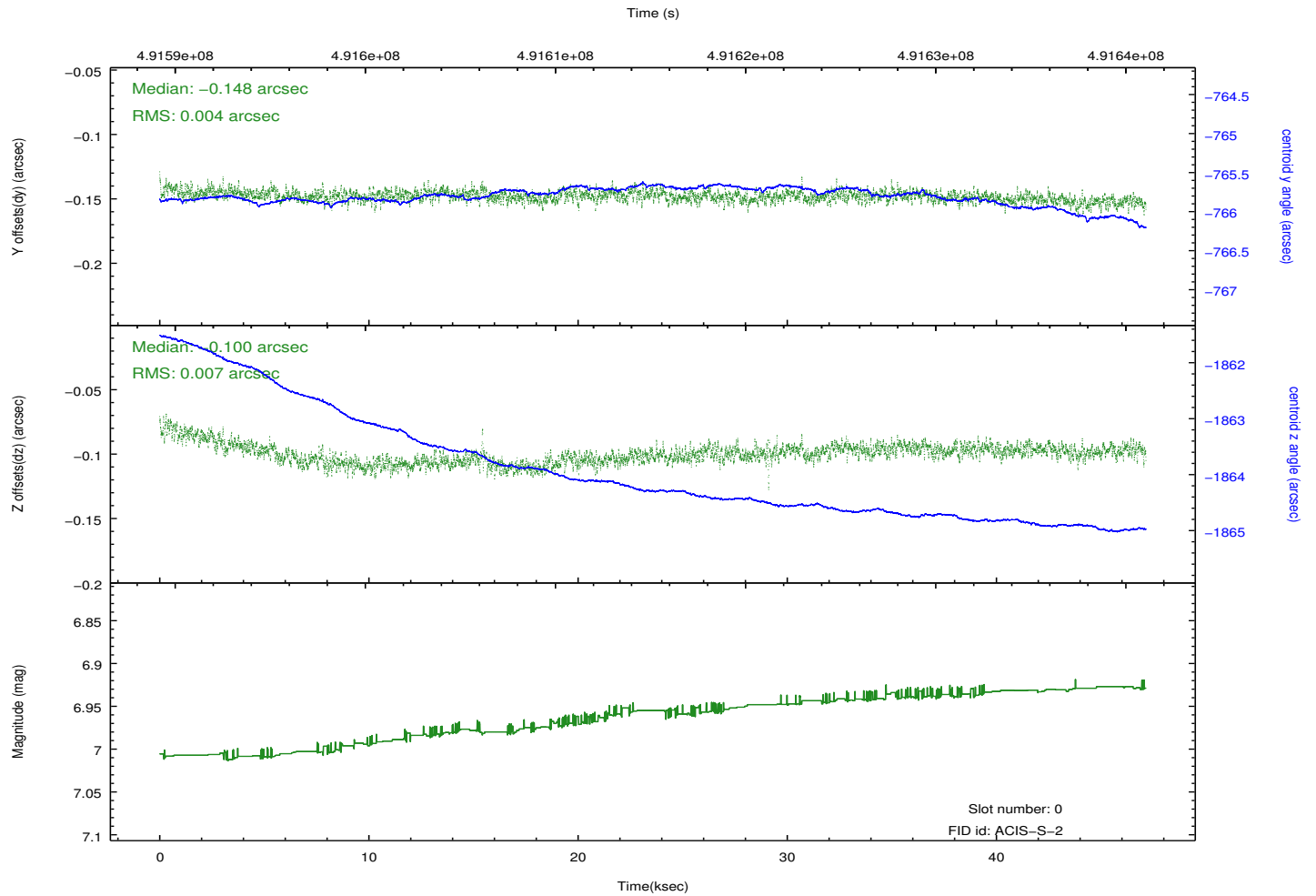
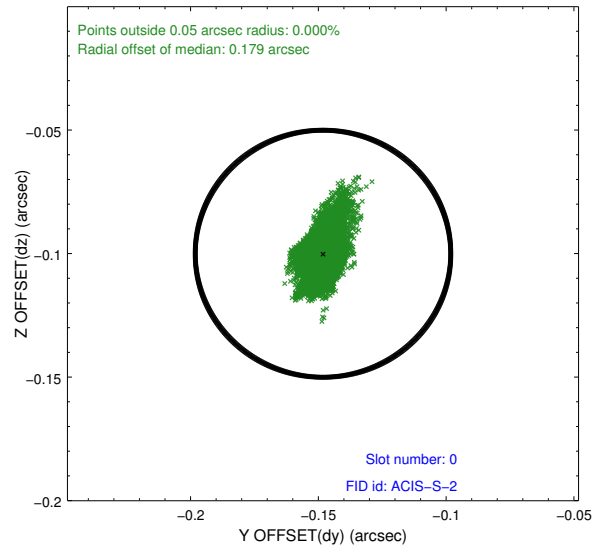
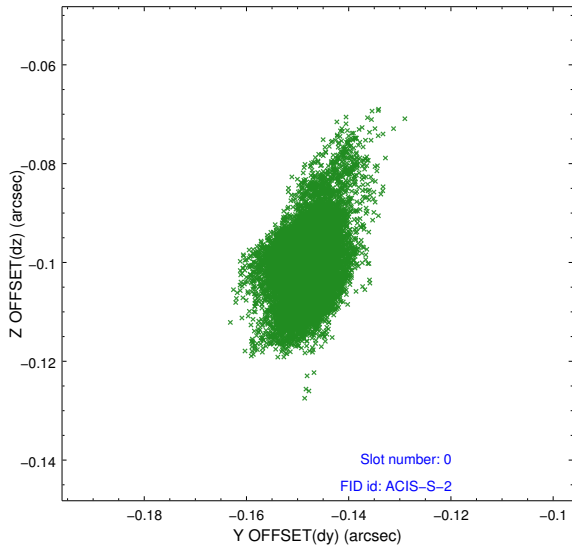


2.4.5 Slot 7

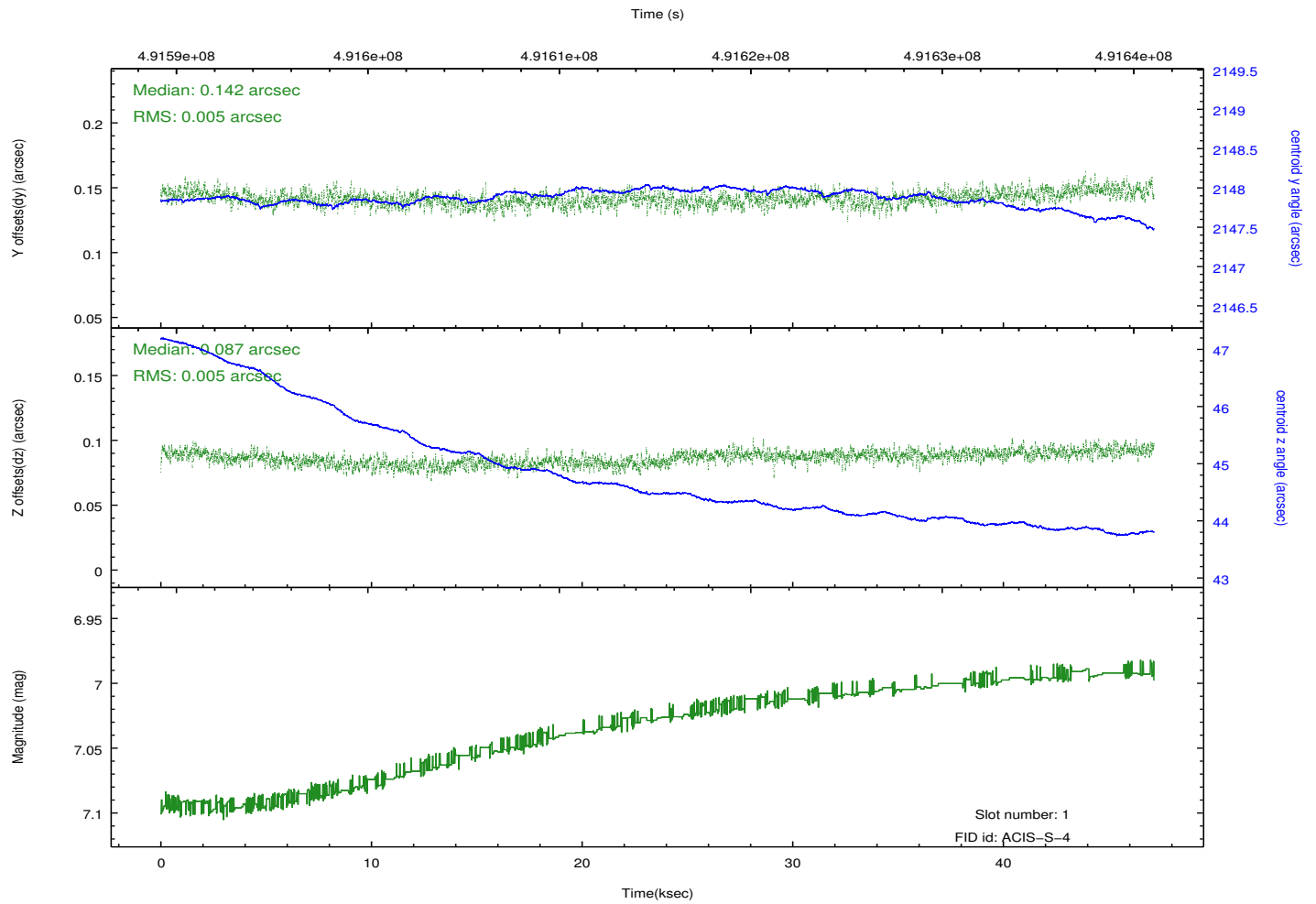
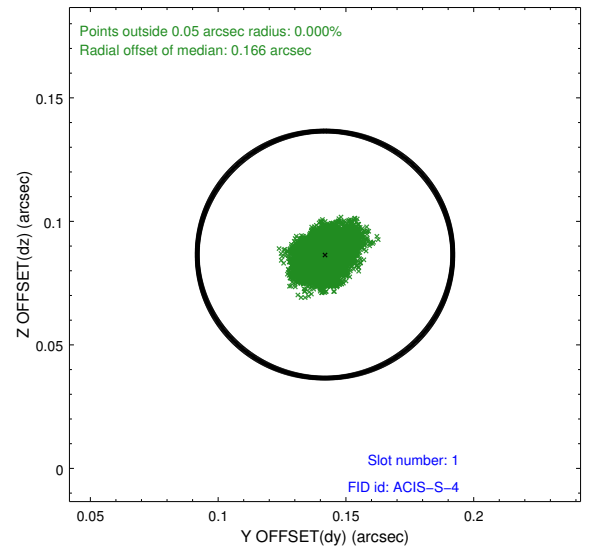
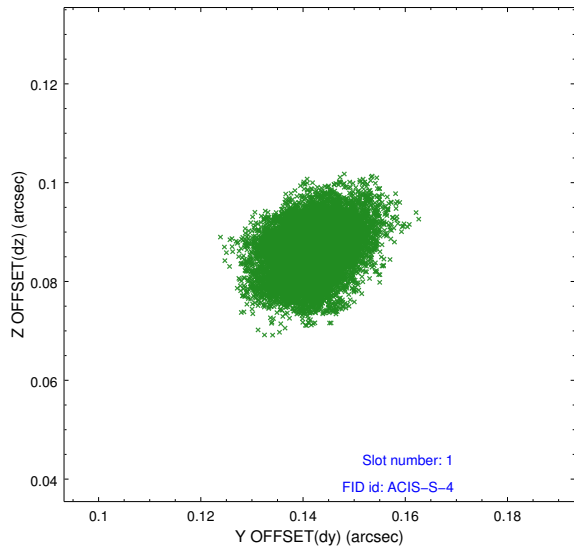


2.5 FID Slots

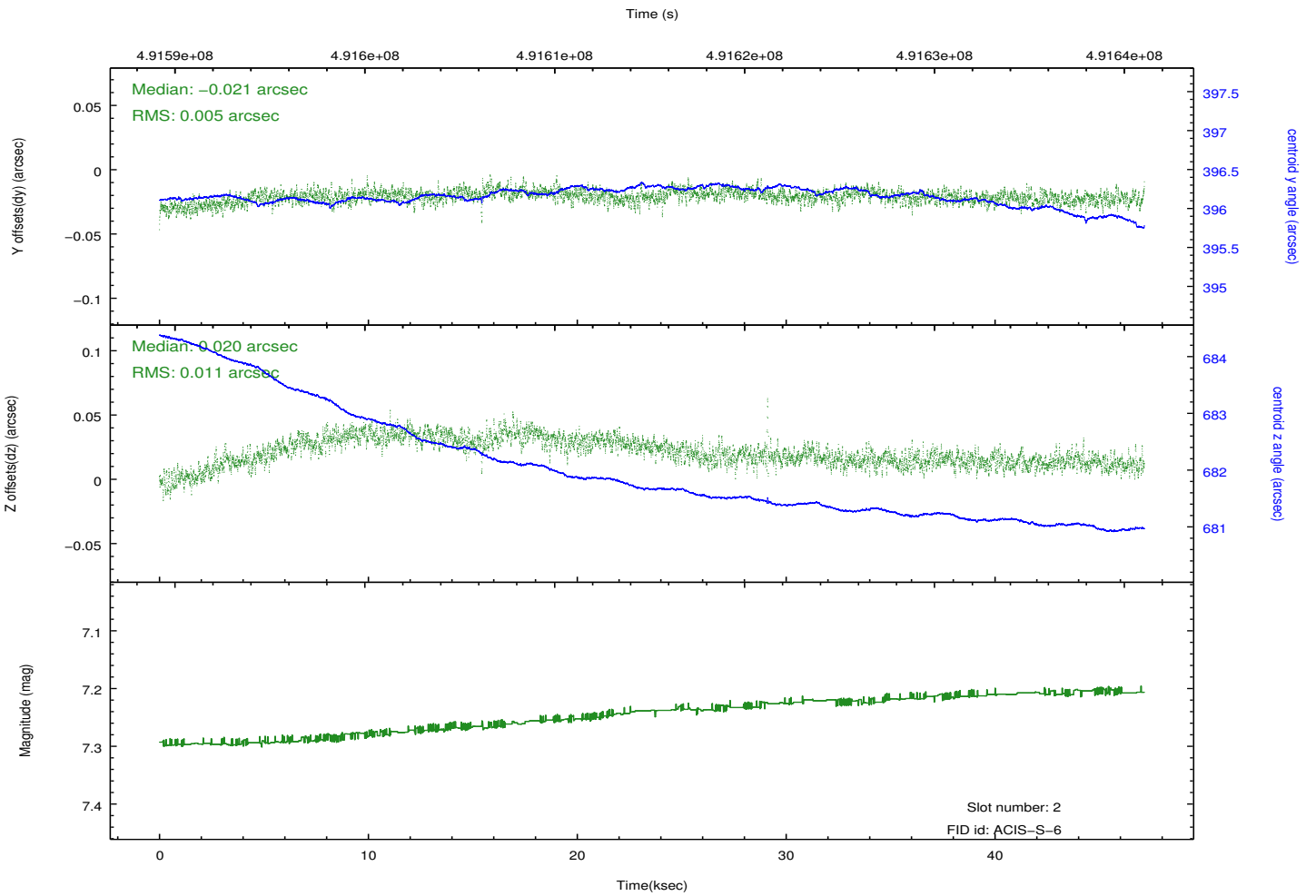
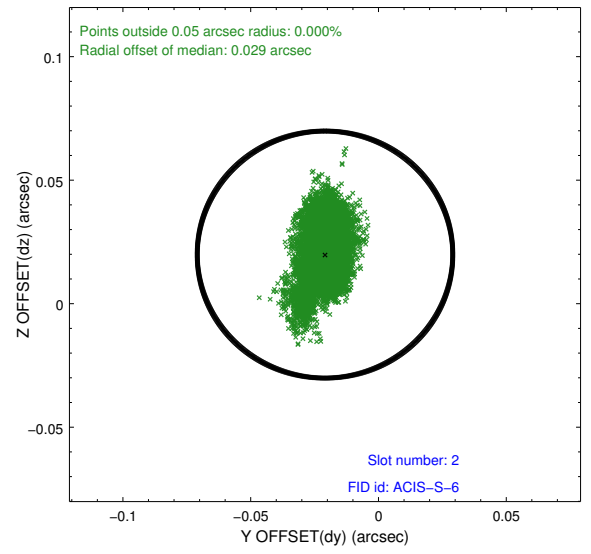
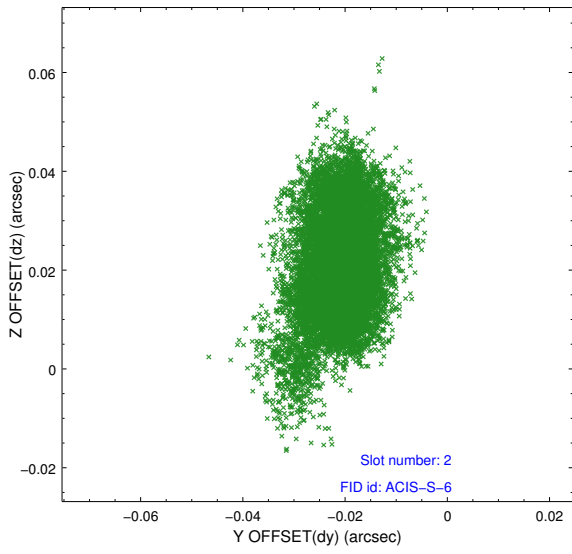
2.5.1 Slot 0



2.5.2 Slot 1

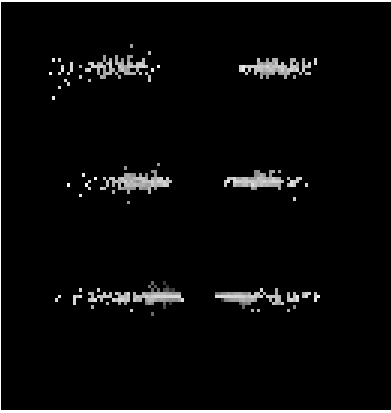


2.5.3 Slot 2

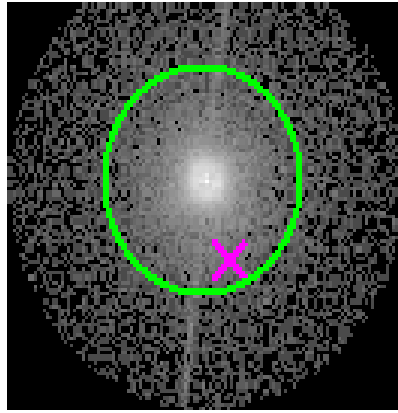


3 Gratings

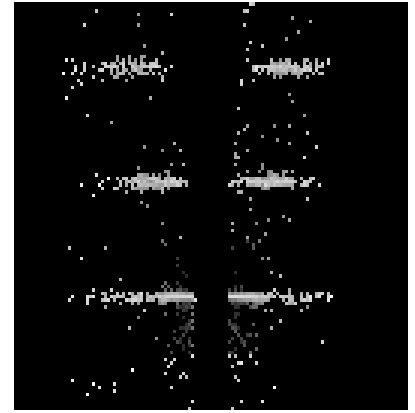
3.1 HEG Arm



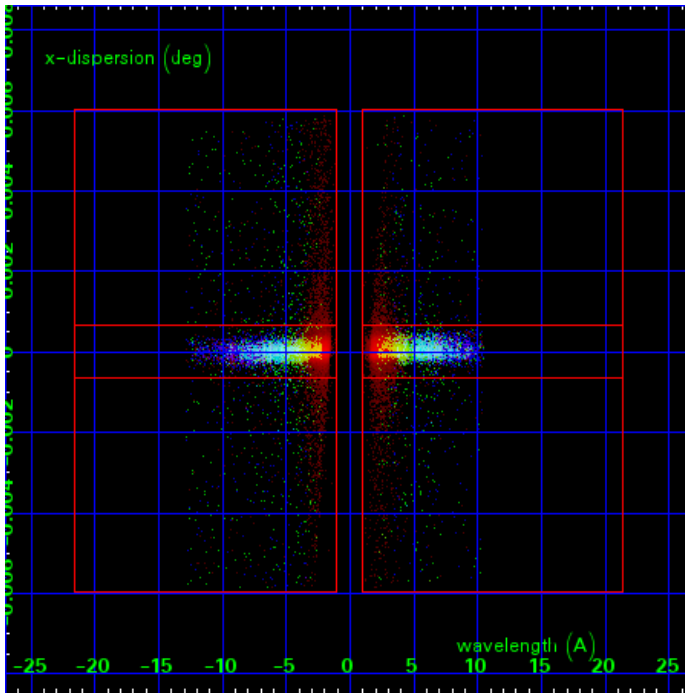
HEG Order Sort 123



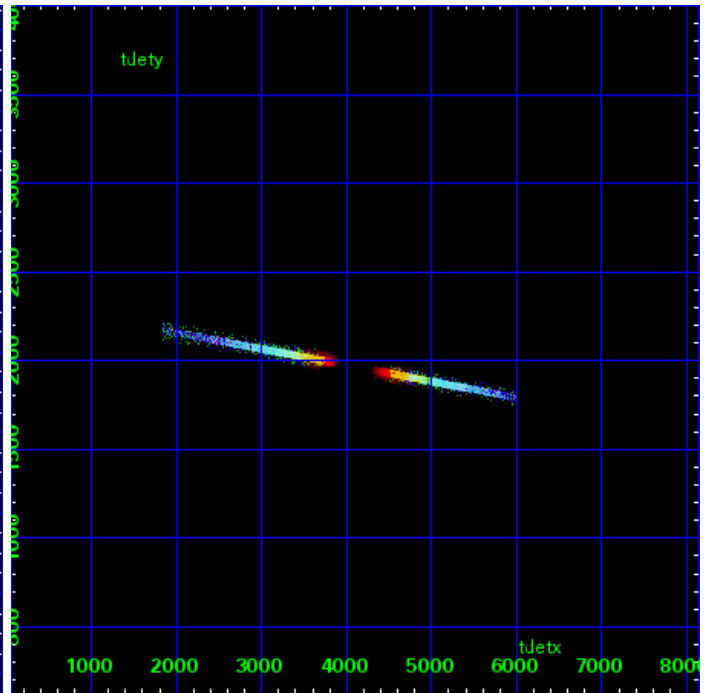
HEG Zero Order



HEG Order Sort ALL

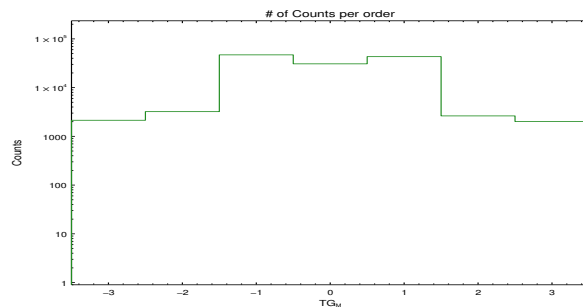


Spot Image HEG

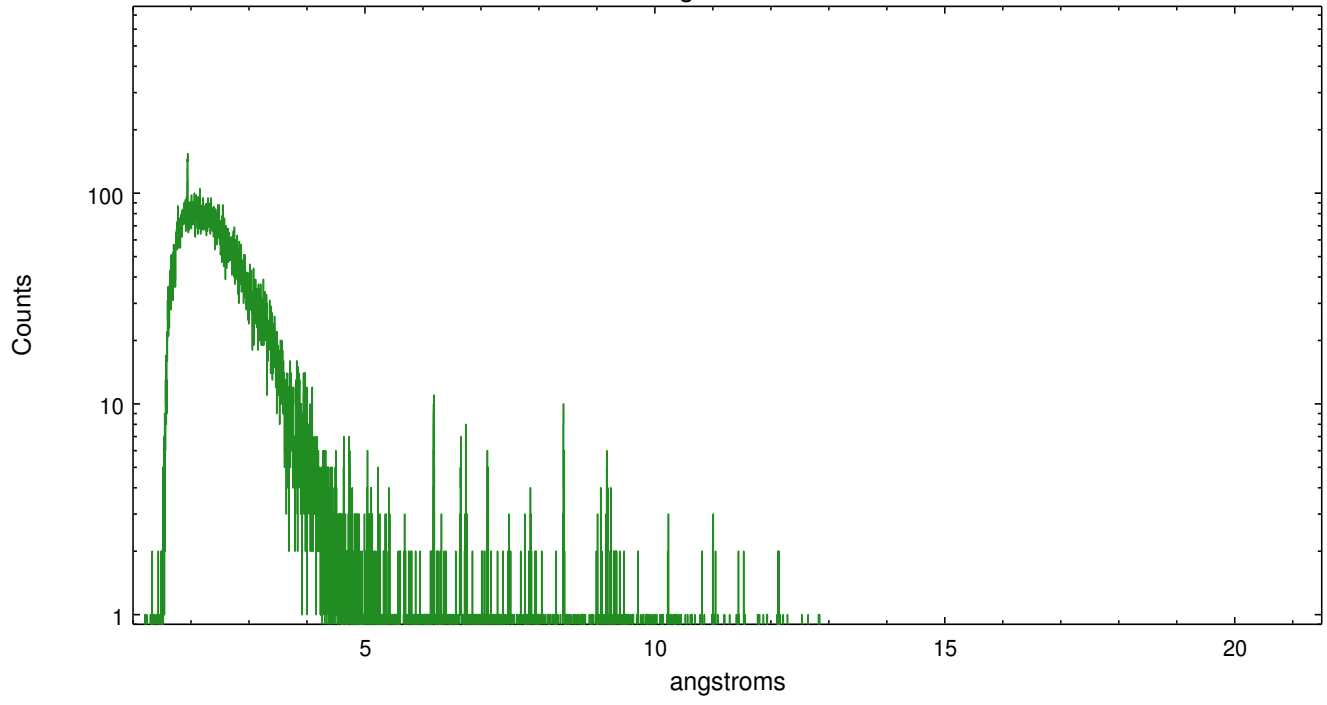


Full Detector HEG

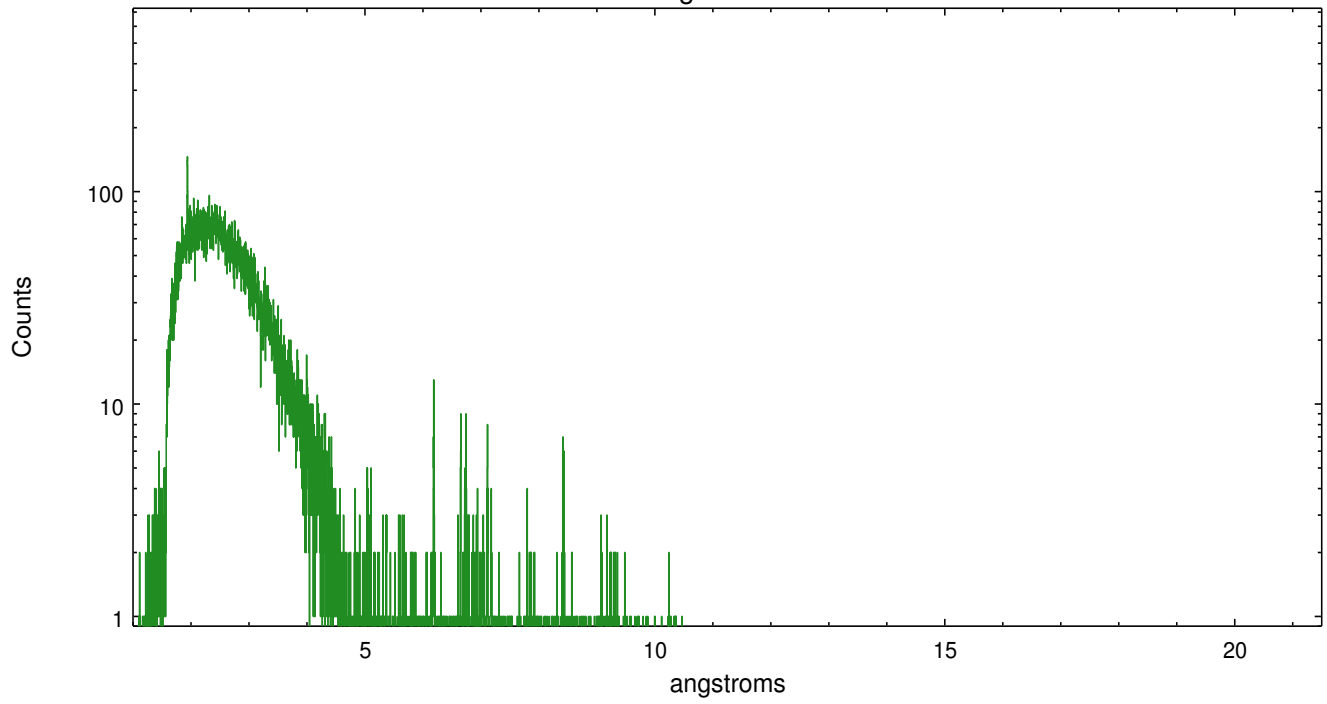
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	2137	3215	47007	30753	43202	2628	2015



heg order -1



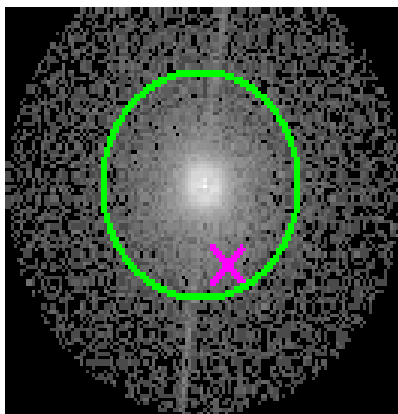
heg order +1



3.2 MEG Arm



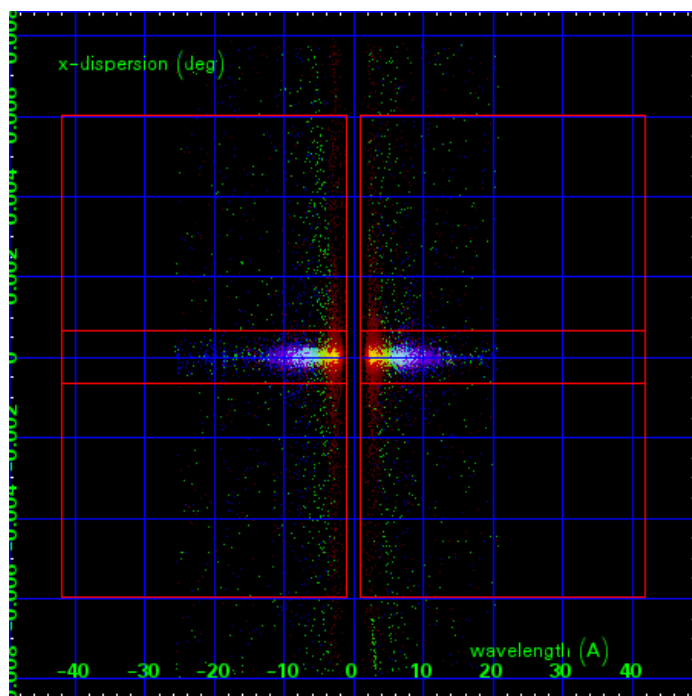
MEG Order Sort 123



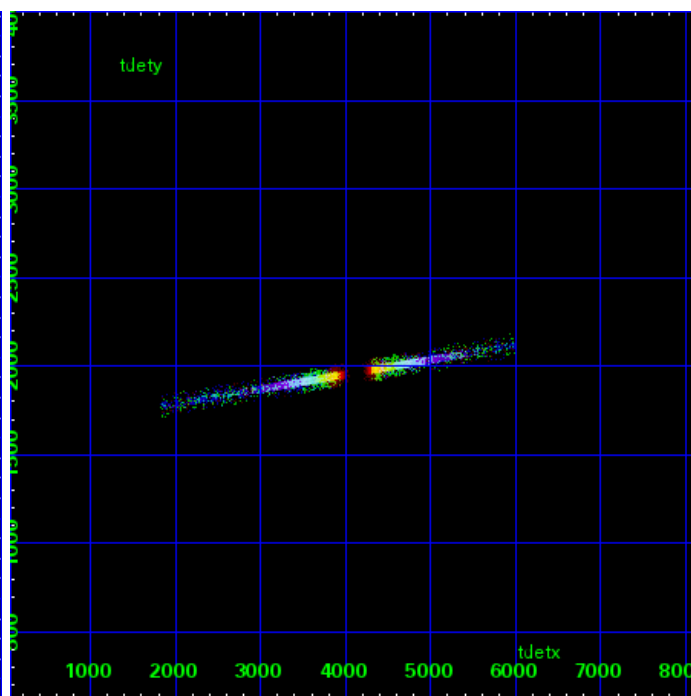
MEG Zero Order



MEG Order Sort ALL

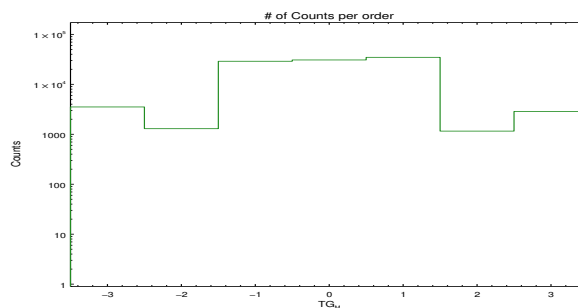


Spot Image MEG

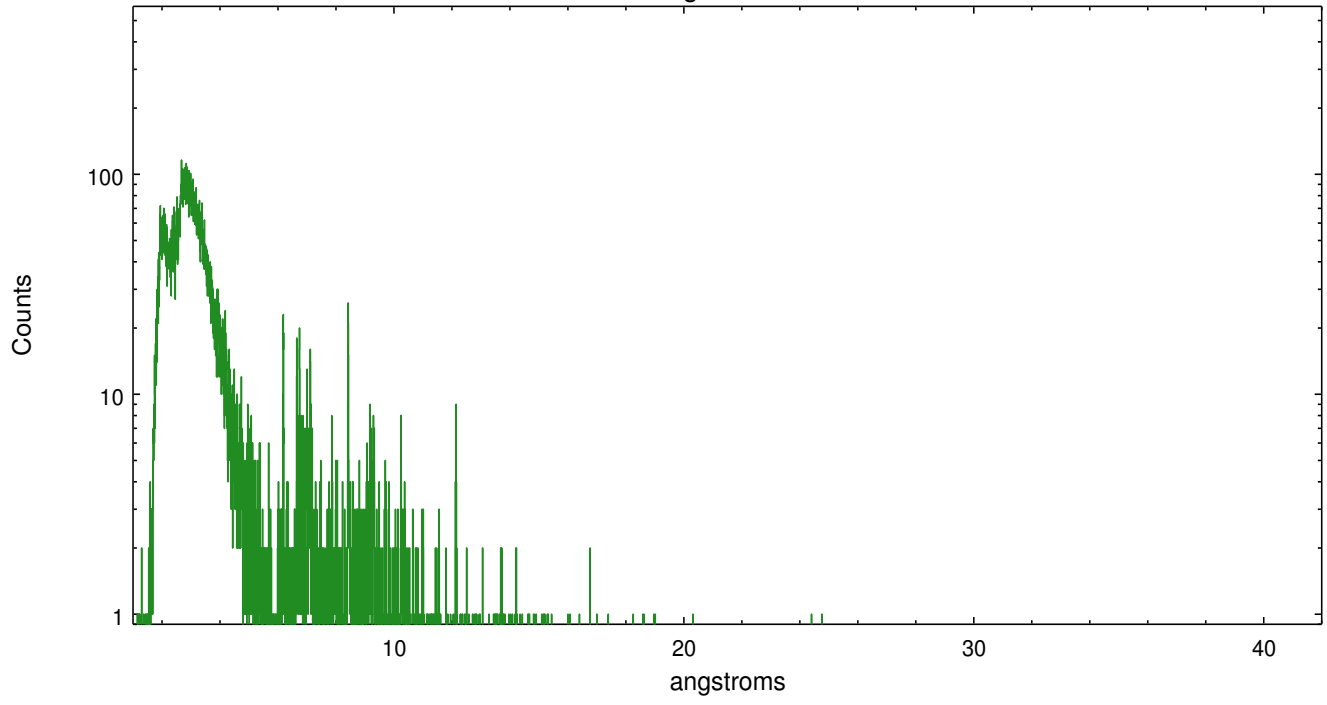


Full Detector MEG

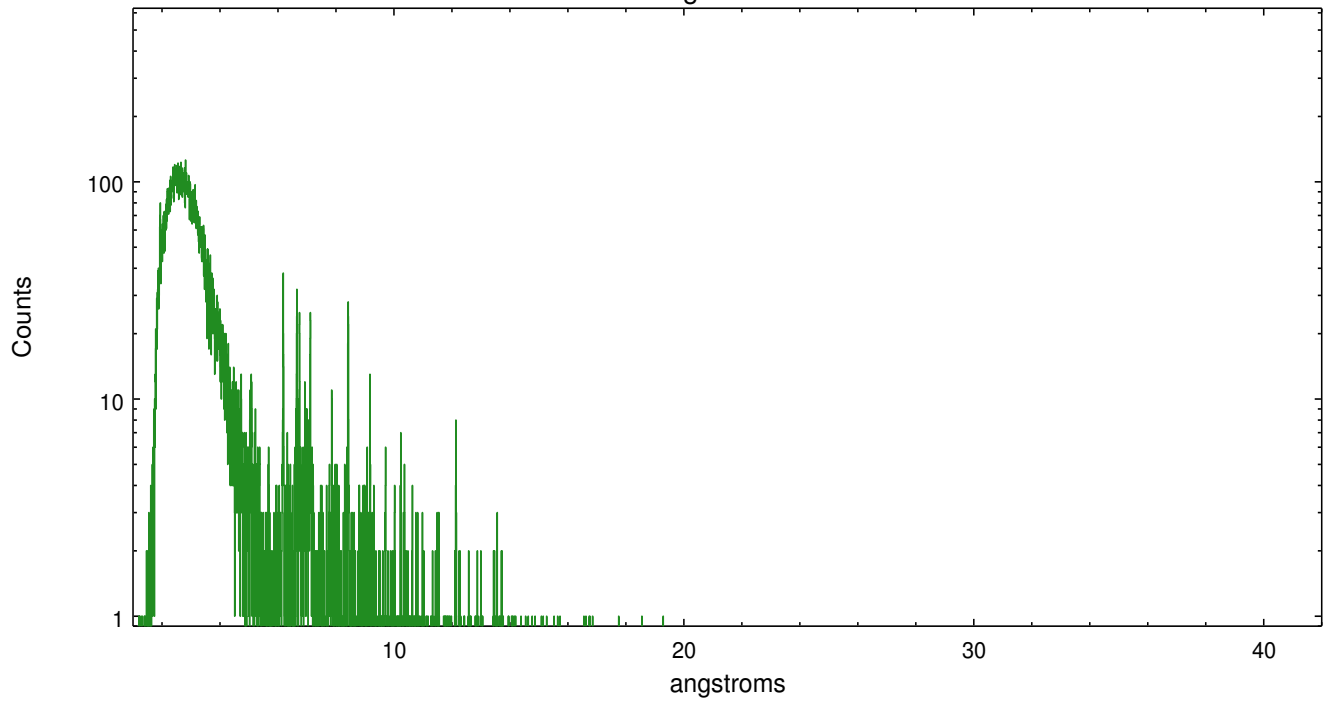
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	3525	1295	28950	30753	34691	1157	2863



meg order -1



meg order +1



A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2015.05.01
V&V Edition	2
V&V Disposition and Status	OK
V&V Charge Time	47.057600701213

A.2 Comments

Zeroth order piled up. The zeroth order sky position was determined using a software tool developed by CXC called findzero, which is available in CIAO as part of the tgdetect2 tool. The tool calculates the point of intersection of the readout streak on the ACIS CCD and the meg dispersed spectral arm, rather than using a centroid position of the source. The findzero results are more accurate than source centroid in this case. ===

Faint grating spectra can be seen in an image of bad events. This is probably due to pileup in the spectrum, causing migration to bad grades. This should be considered in analysis. --- 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. === Only 4 CCD chips were used in this observation. The softest X-ray portion of the dispersed spectrum was not on an active chip.

=====

These data have been reprocessed with new aspect alignment calibration files that correct small mean offsets (up to 0.4 arcsecs) and improve overall astrometric accuracy. The new calibration was determined using data from the time period being reprocessed and was performed using cross-correlation of X-ray sources with radio and optical counterparts.