

V&V Reference Report

L2 ASCDS Version : 10.2.2

Observation 16429 - L2 Version 2
Chandra X-Ray Center

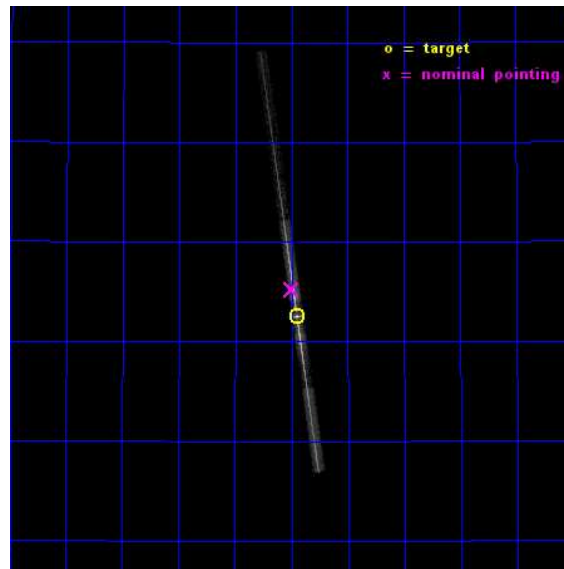
L2 Processing Date : Dec 12 2014

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1 Front

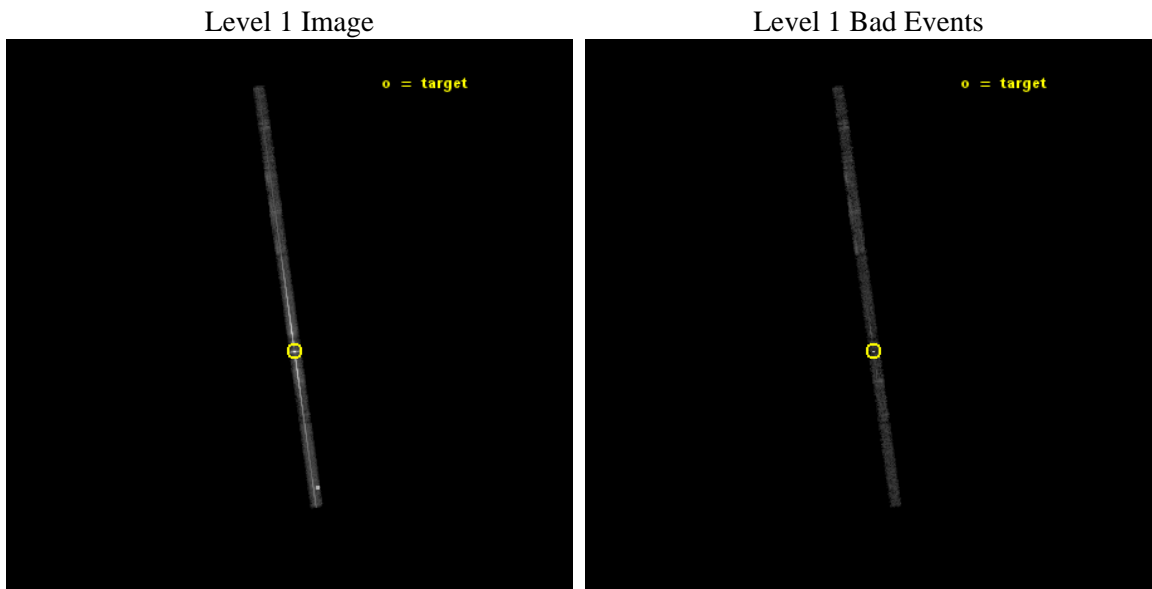
seq_num	790269	Sequence number
obs_id	16429	Observation id
title	AO-15 Calibration Observations of Mkn421	Proposal title
observer	Dr. CXC Calibration	Principal investigator
object	MKN421	Source name
dtycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	166.113333	Observer's specified target RA [deg]
dec_targ	38.208806	Observer's specified target Dec [deg]
ra_nom	166.1250343584	Nominal RA [deg]
dec_nom	38.253865328697	Nominal Dec [deg]
roll_nom	261.80413294355	Nominal Roll [deg]
revision	2	Processing version of data
ontime	10077.199828327	Sum of GTIs [s]
liveltime	9519.108118089	Livetime [s]
ontime5	10077.199828327	Sum of GTIs [s]
ontime6	10077.199828327	Sum of GTIs [s]
ontime7	10077.199828327	Sum of GTIs [s]
ontime8	10077.199828327	Sum of GTIs [s]
ontime9	10077.199828327	Sum of GTIs [s]
l2events	144126	Number of level 2 events



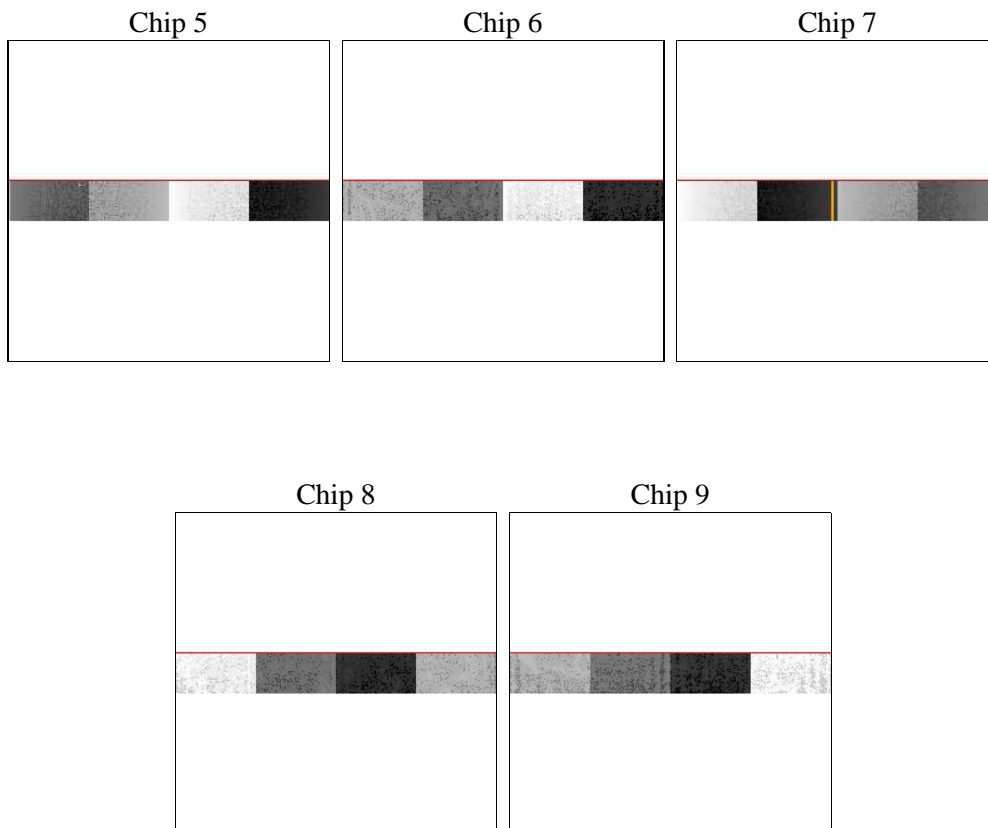
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	10000.000000	[s] Scheduled observation exposure time
ascdsver	10.3.1	Processing system revision	ontime	10077.199828327	Sum of GTIs [s]
caldbver	4.6.4	 	ontime5	10077.199828327	Sum of GTIs [s]
date	2014-12-12T06:40:40	Date and time of file creation	ontime6	10077.199828327	Sum of GTIs [s]
revision	2	Processing version of data	ontime7	10077.199828327	Sum of GTIs [s]
			ontime8	10077.199828327	Sum of GTIs [s]
			ontime9	10077.199828327	Sum of GTIs [s]
			l1events	201804	Number of level 1 events
			tgmethod	FINDZO	Method used to create src1a file
			zo_pos	(4160.77, 3767.35)	src1a sky pixel position

2.1.4 Events

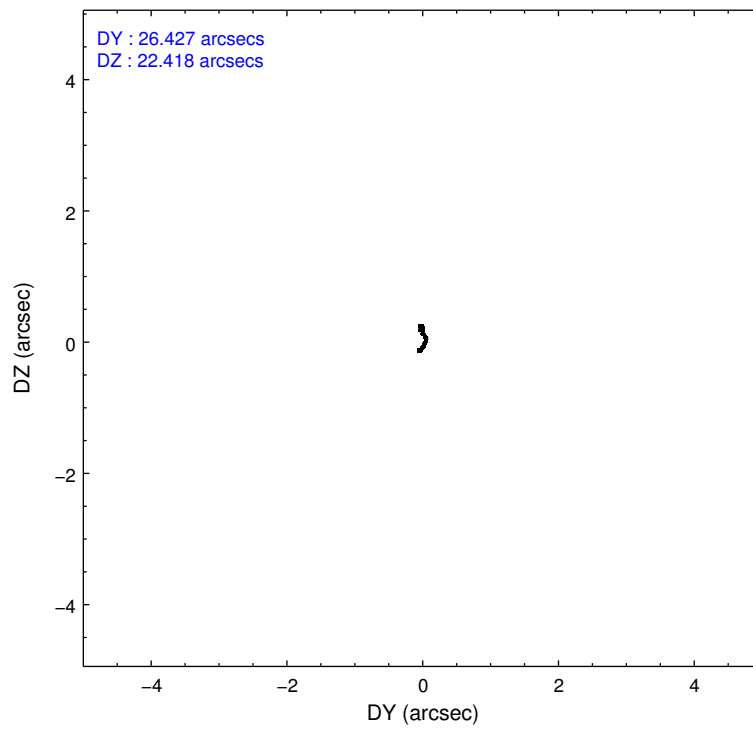
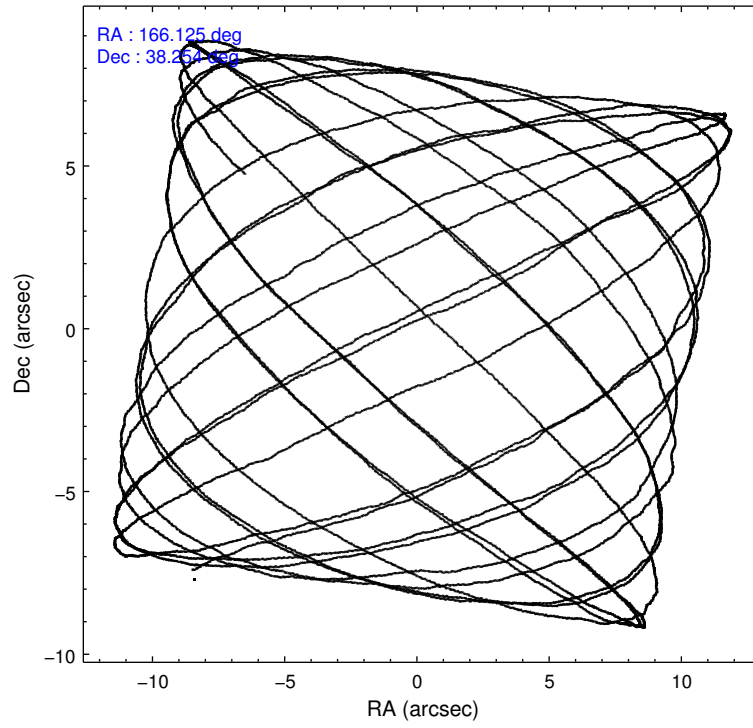
	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	32736	89482	57549	14051	7986
rejected events	5475	12646	5554	8786	6008
rejected %	16%	14%	9%	62%	75%

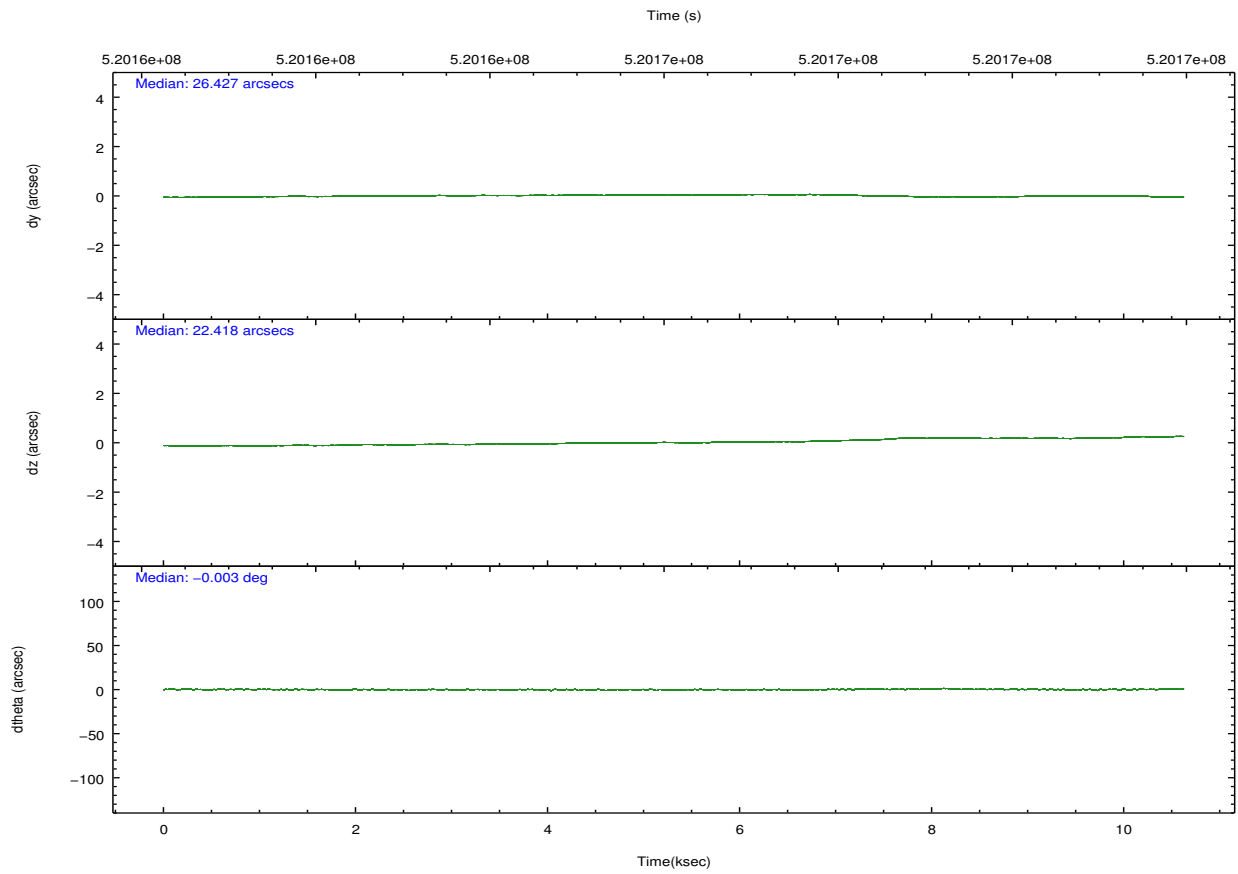
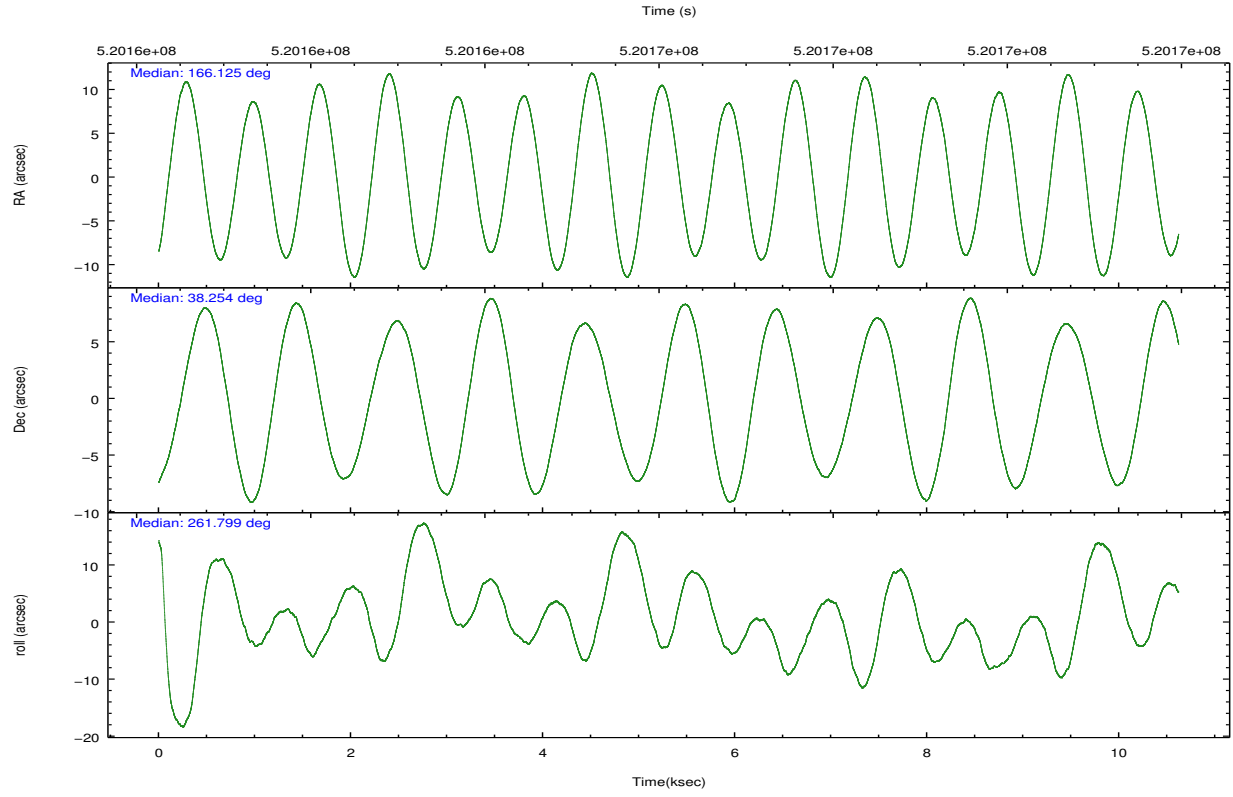
	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
grade 0 events	17210	58073	14896	2876	1210
	52%	64%	25%	20%	15%
grade 1 events	38	3256	58	6	2
	0%	3%	0%	0%	0%
grade 2 events	4960	9190	13556	800	235
	15%	10%	23%	5%	2%
grade 3 events	935	3275	6244	364	164
	2%	3%	10%	2%	2%
grade 4 events	1111	3157	5971	322	174
	3%	3%	10%	2%	2%
grade 5 events	1020	2221	1273	489	361
	3%	2%	2%	3%	4%
grade 6 events	3049	3149	11332	904	195
	9%	3%	19%	6%	2%
grade 7 events	4413	7161	4219	8290	5645
	13%	8%	7%	58%	70%

2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-56789	ACIS-56789	Obspar file type	PREDICTED	ACTUAL
Grating	LETG	LETG	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	166.111656	166.1250343584043	CCD I2 on	N	N
[deg] Pointing Dec	38.279071	38.25386532869732	CCD I3 on	N	N
[deg] Pointing Roll	261.655792	261.8041329435501	CCD S0 on	N	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)	520161426.184000	520160476.62164	CCD S5 on	O1	Y
Observation start date	2014-06-26T09:15:59	2014-06-26T09:01:16	Number of optional ACIS chips dropped	0	0
[s] Observation end time (MET)	520171426.184000	520171658.34726	On-chip summing requested	N	N
Observation end date	2014-06-26T12:02:39	2014-06-26T12:07:38	Subarray requested	CUSTOM	1/8
Read mode	TIMED	TIMED	Subarray start row	449	449
			Subarray row count	128	128
			Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	0.7

2.3 Aspect





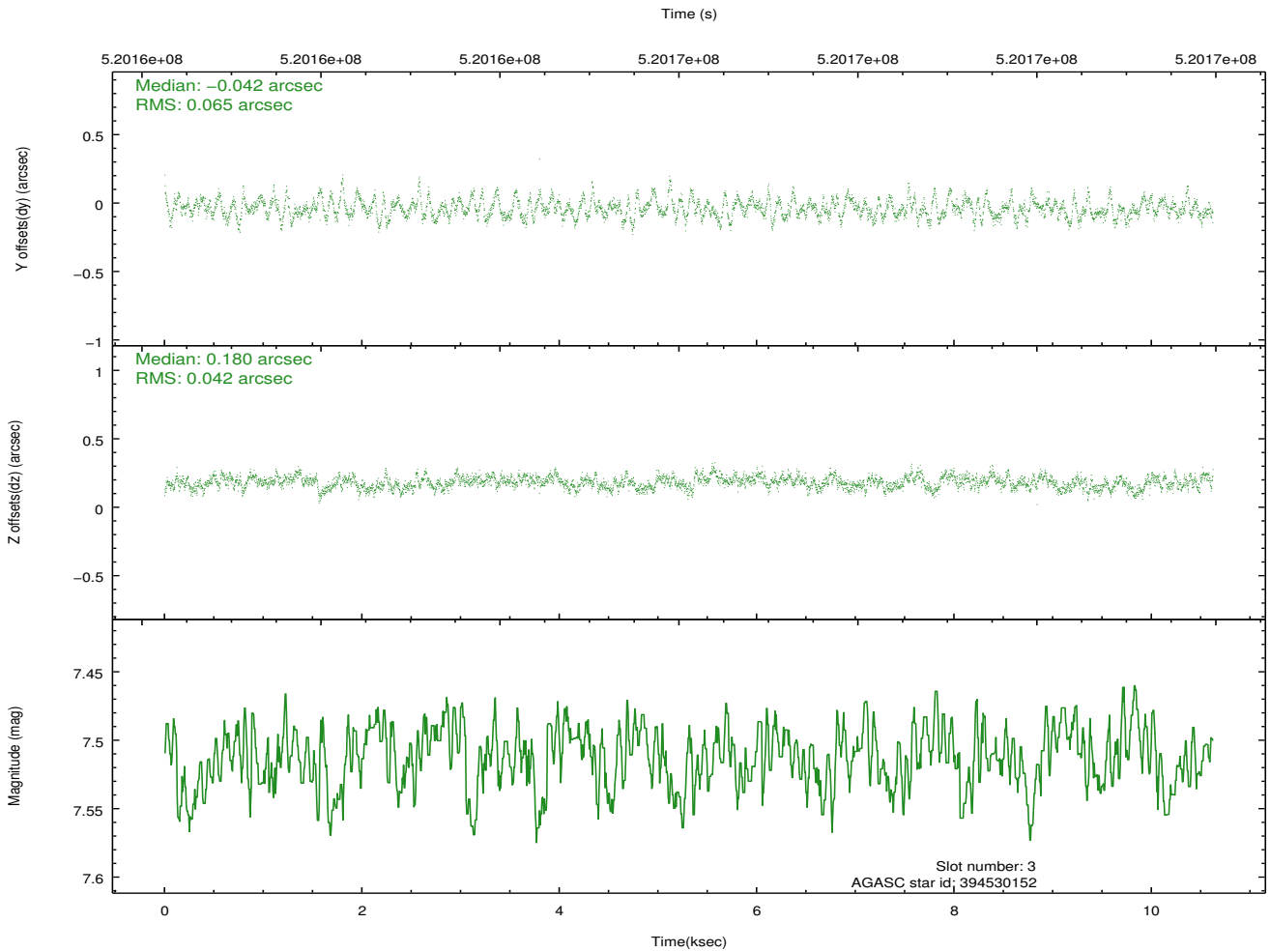
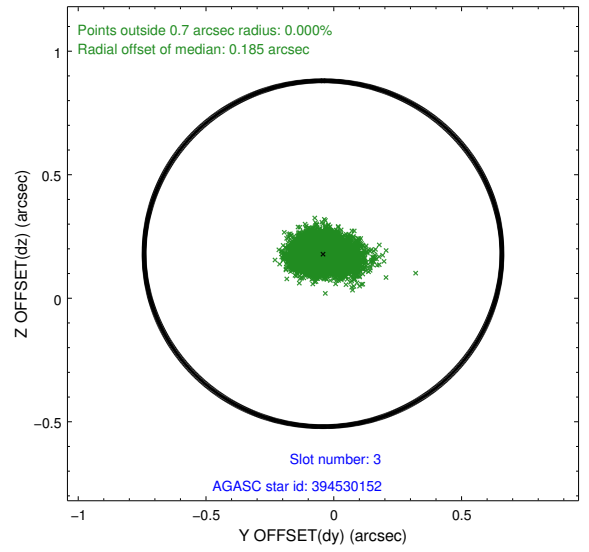
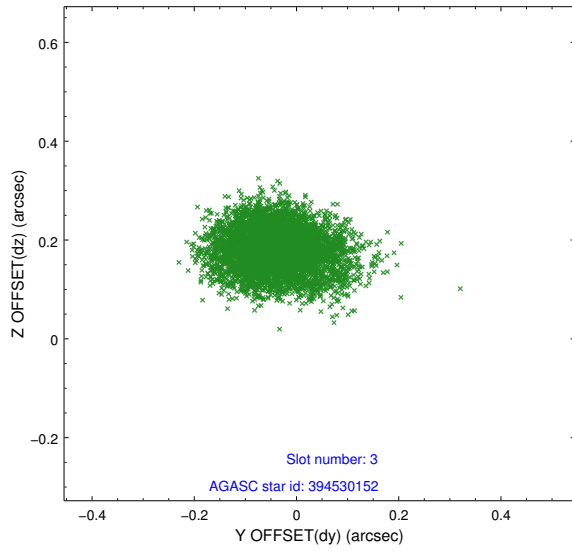
Slot Statistics

slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-S-2	6.87	2591	-0.150	-0.024	0.007	0.011	0.000000	0.000000	-779.88	-1744.04
1	FID		ACIS-S-4	6.97	2591	0.303	0.079	0.005	0.009	0.000000	0.000000	2133.64	164.00
2	FID		ACIS-S-5	7.00	2591	-0.185	-0.046	0.007	0.012	0.000000	0.000000	-1832.11	158.14
3	GUIDE	used	394530152	7.51	5178	-0.042	0.180	0.082	0.135	166.075805	38.868252	-2083.61	-407.03
4	GUIDE	used	394533848	8.72	5182	0.108	0.368	0.103	0.171	166.382906	38.276007	-101.56	755.48
5	GUIDE	used	394543960	9.78	5173	0.197	0.228	0.191	0.304	165.802757	37.787371	1878.17	-612.10
6	GUIDE	used	394546712	6.60	5182	-0.247	0.266	0.111	0.195	166.451462	38.394357	-550.65	887.41
7	GUIDE	used	394546720	6.44	5181	-0.018	-1.039	0.129	0.189	166.130115	38.241361	127.04	70.72

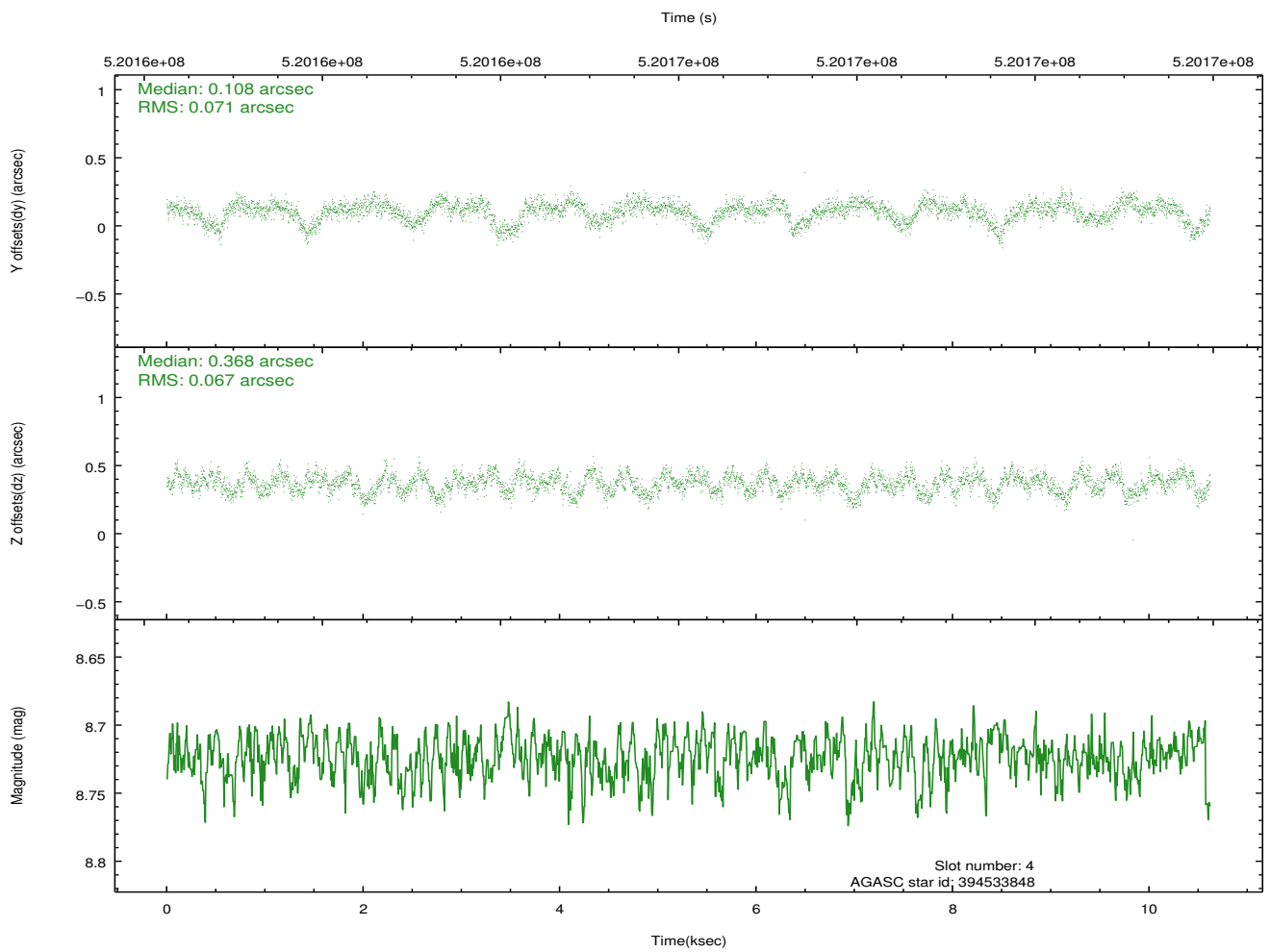
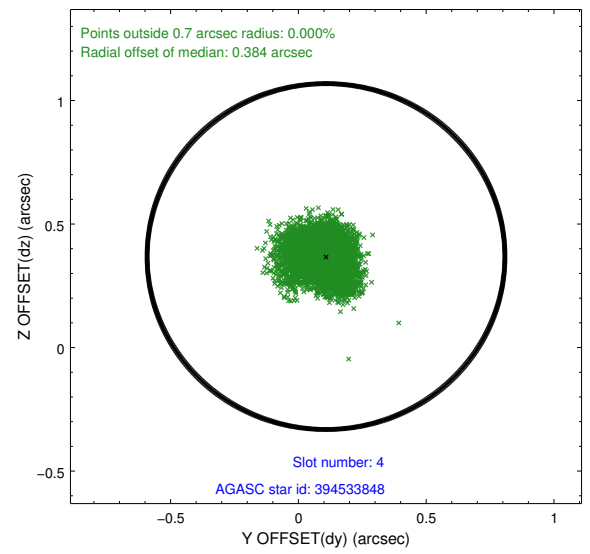
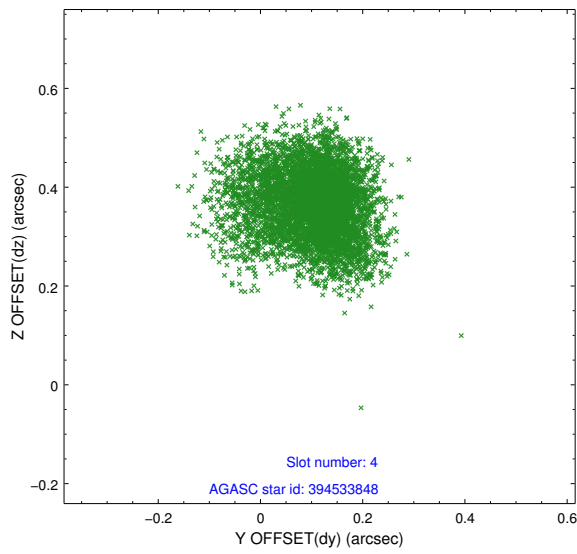
∞

2.4 Star Slots

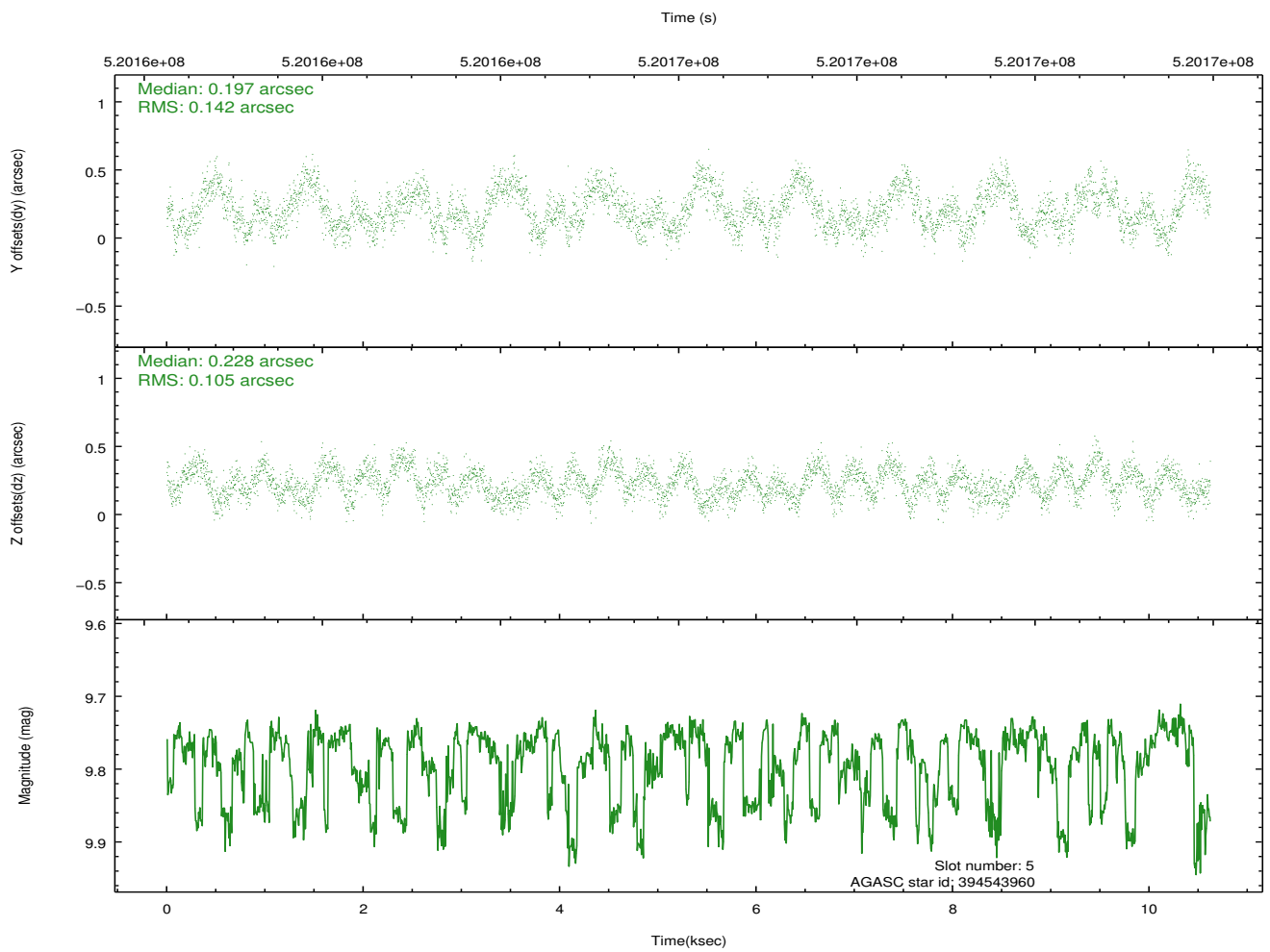
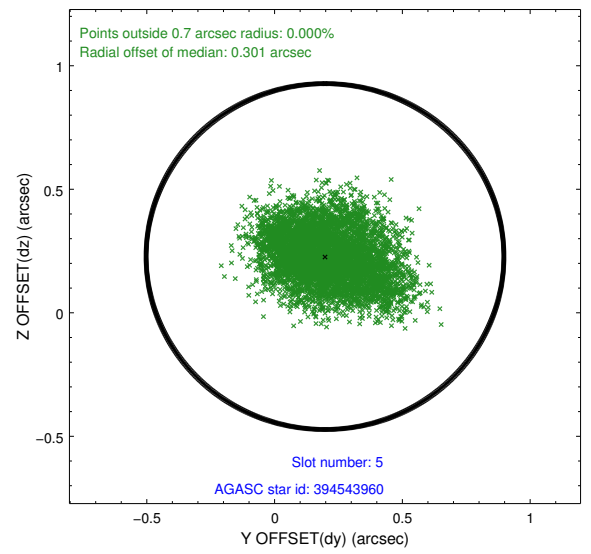
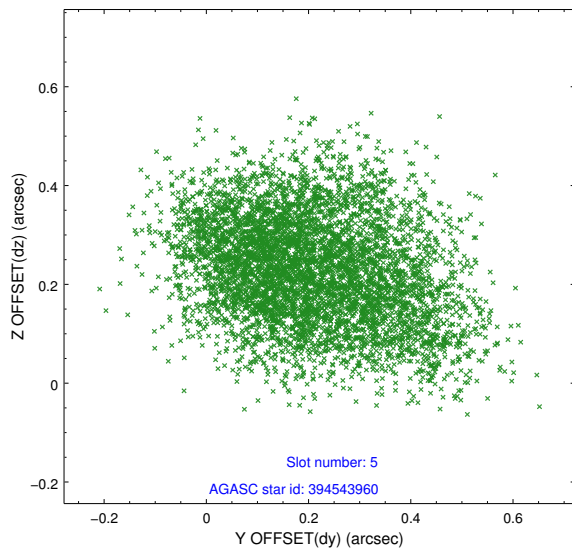
2.4.1 Slot 3



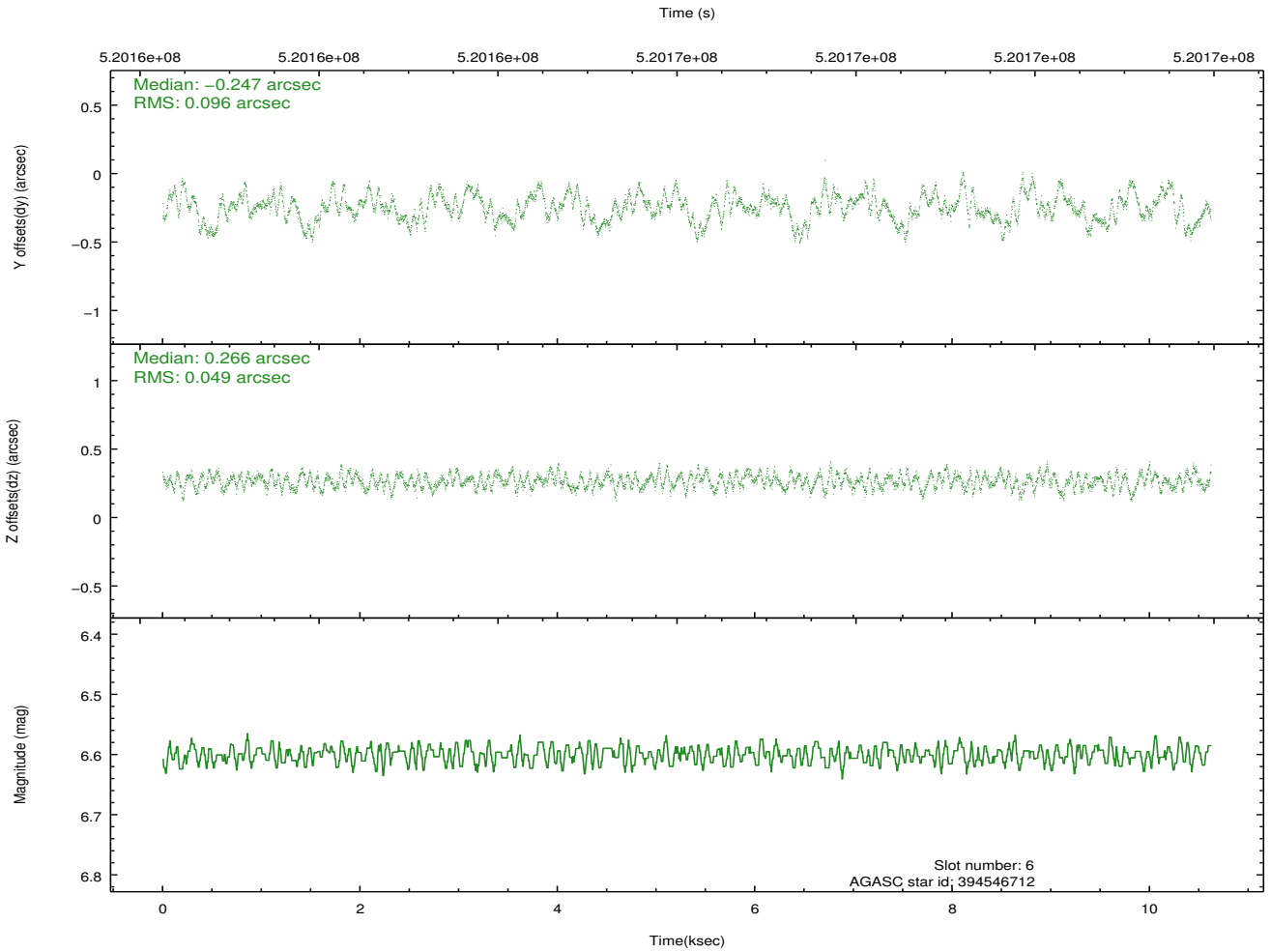
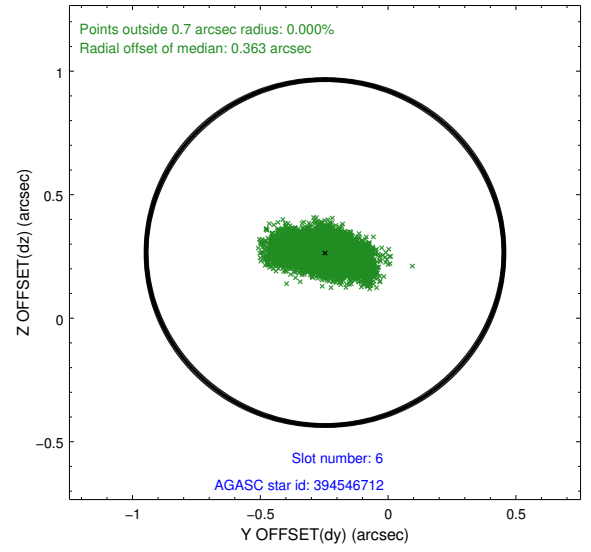
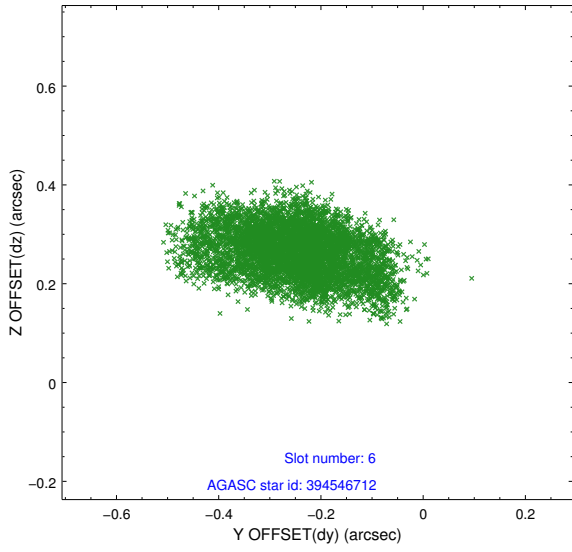
2.4.2 Slot 4



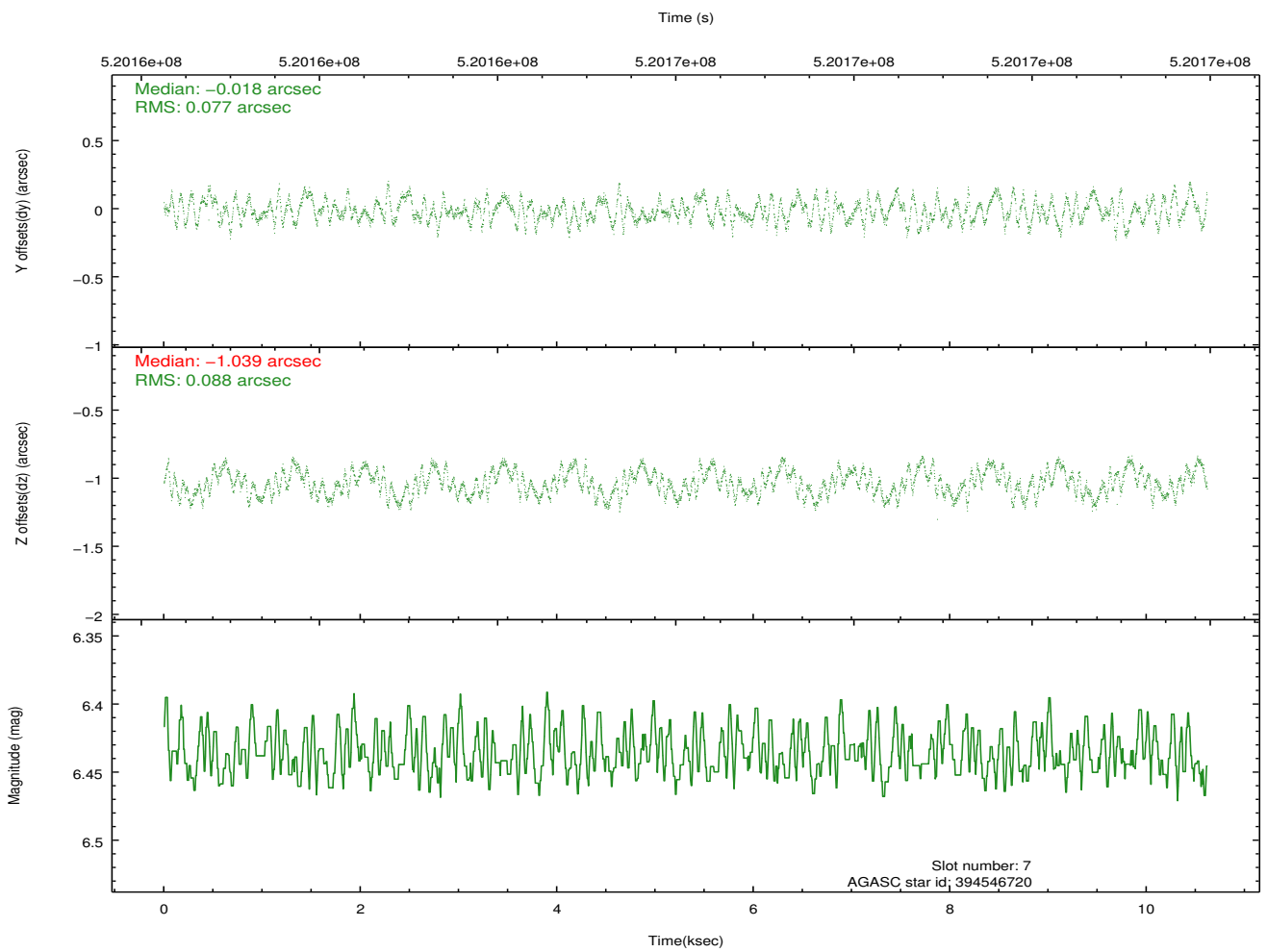
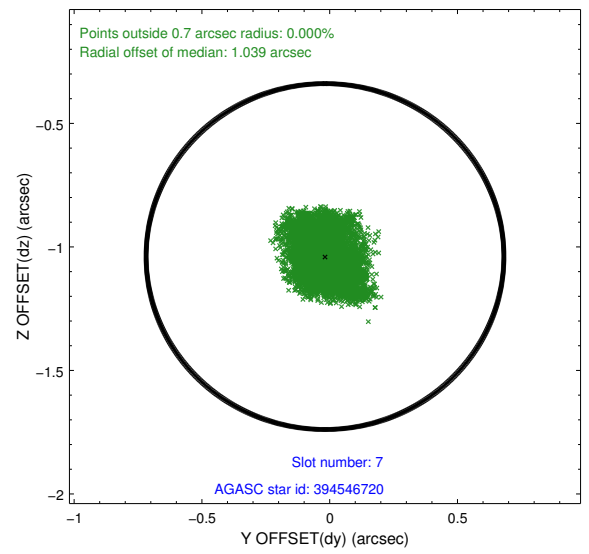
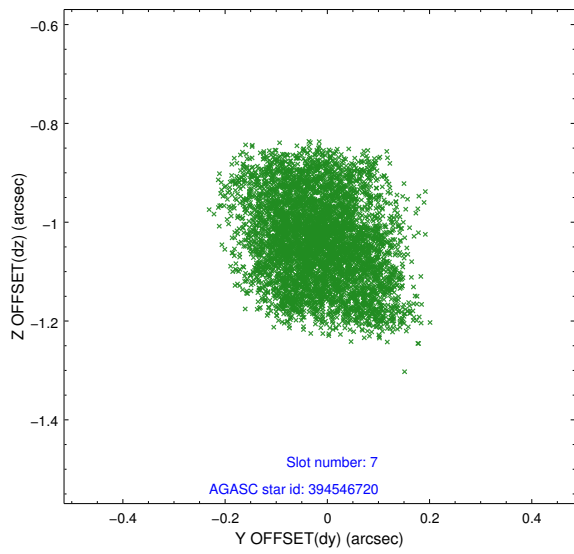
2.4.3 Slot 5



2.4.4 Slot 6

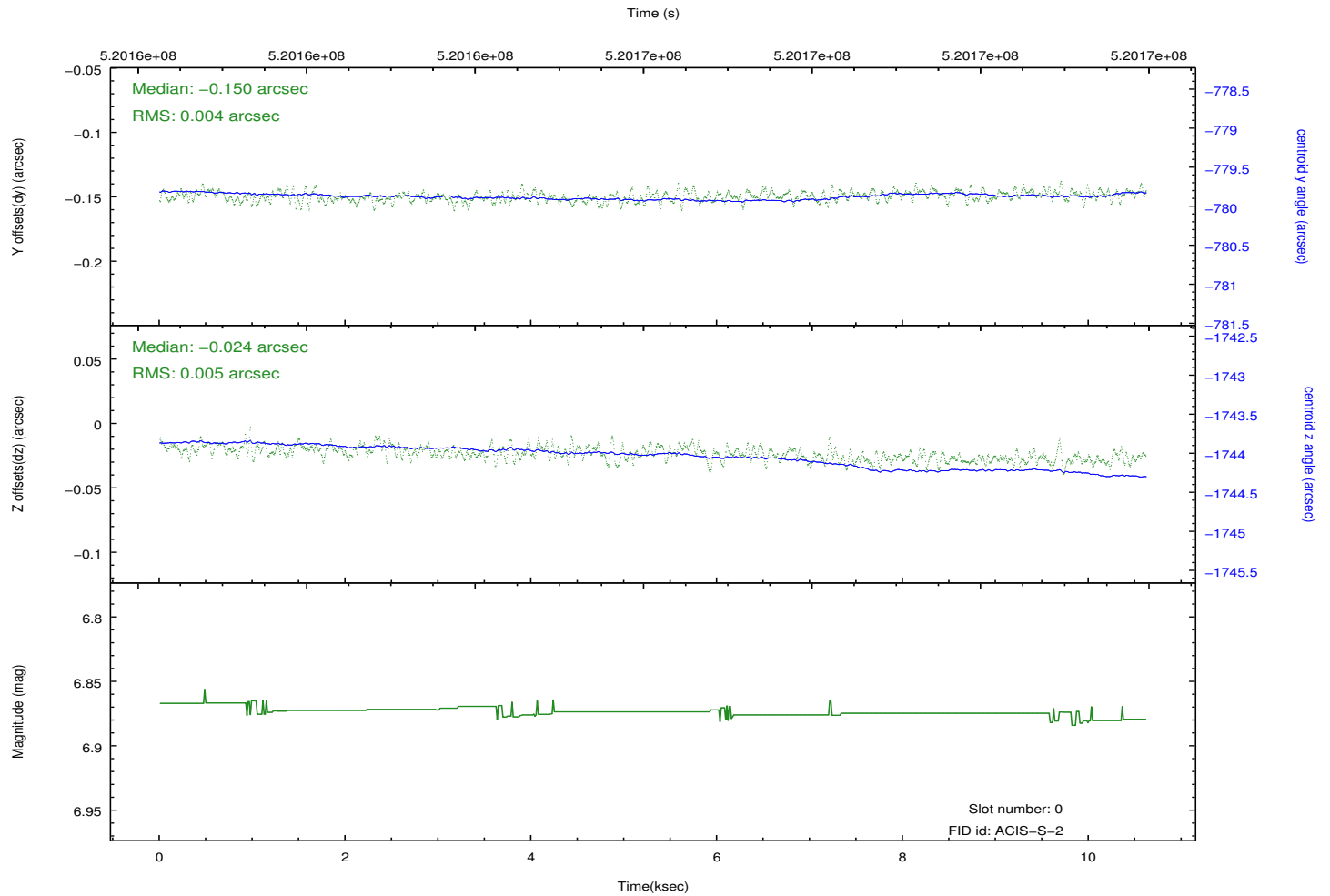
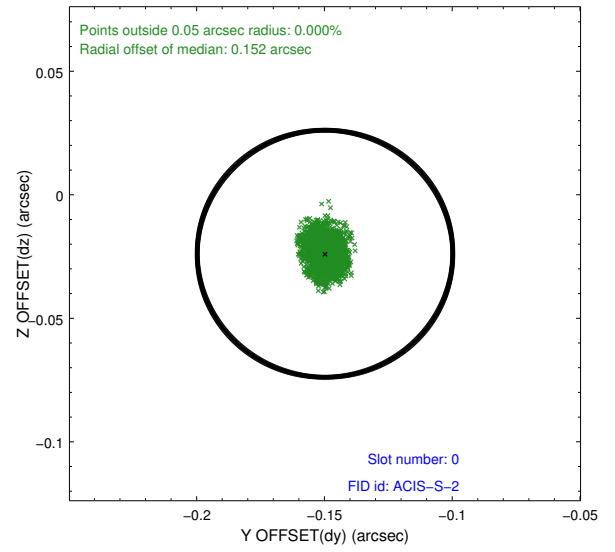
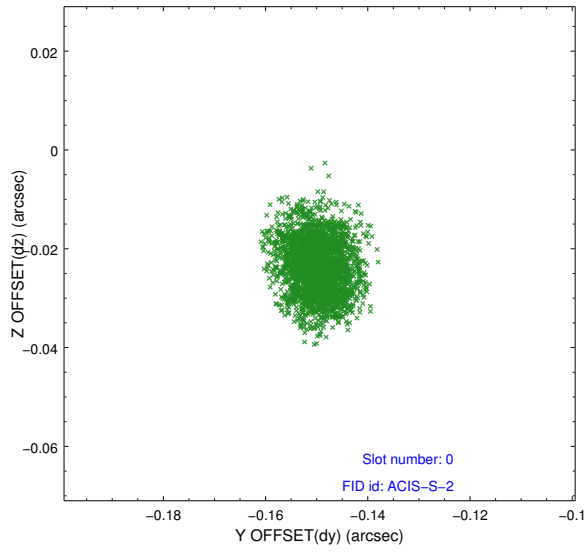


2.4.5 Slot 7

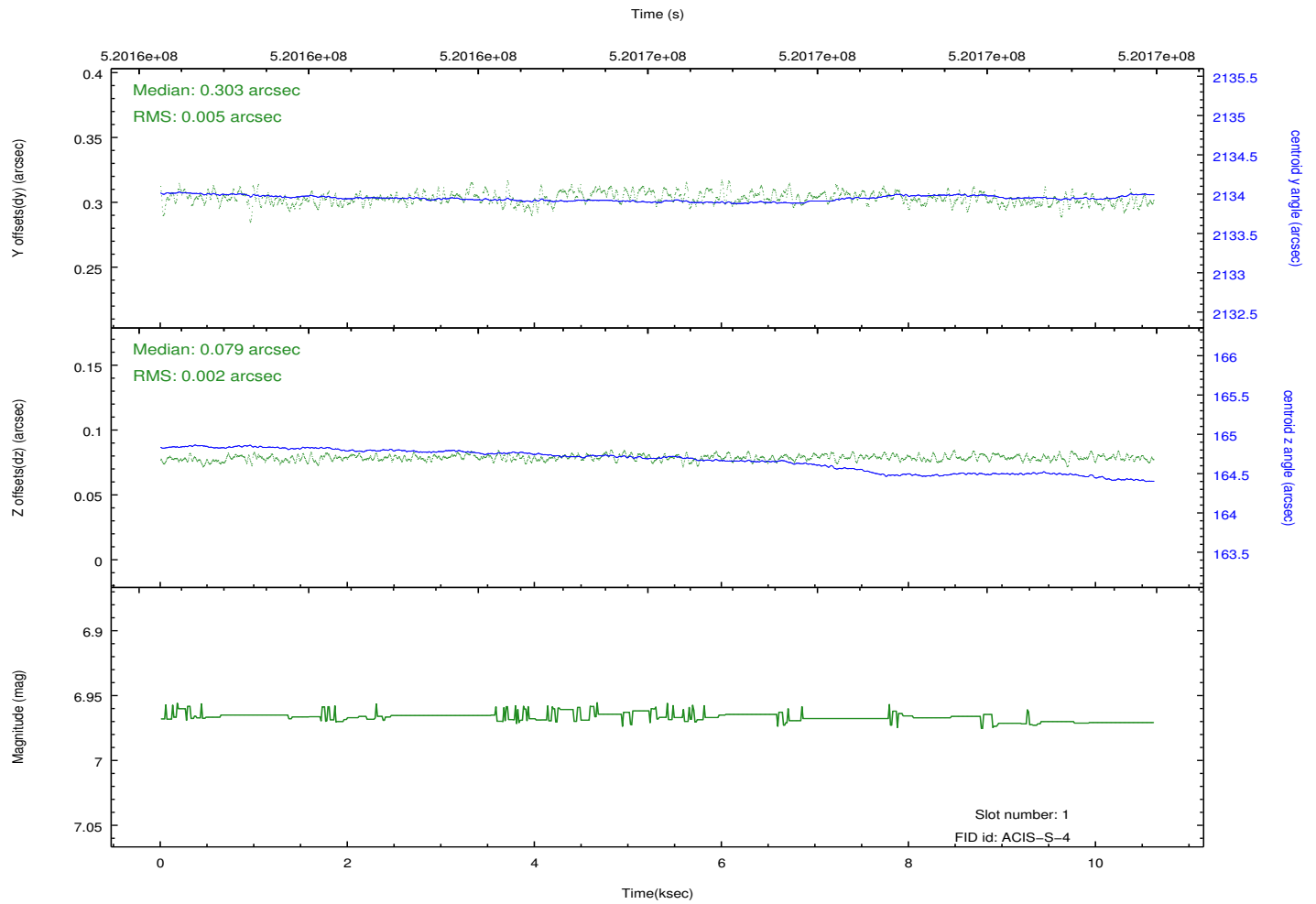
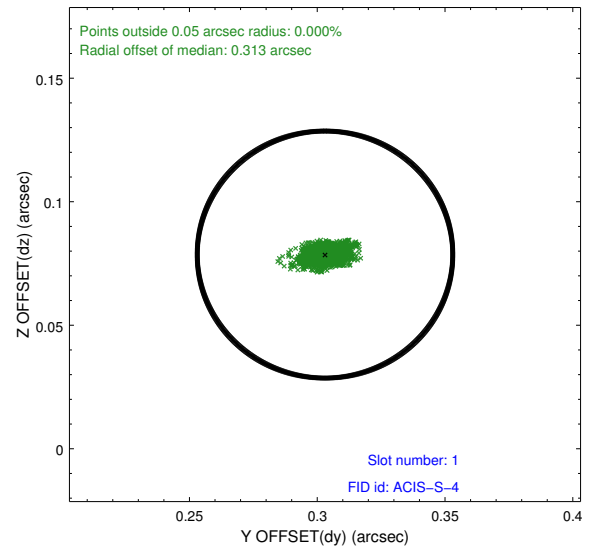
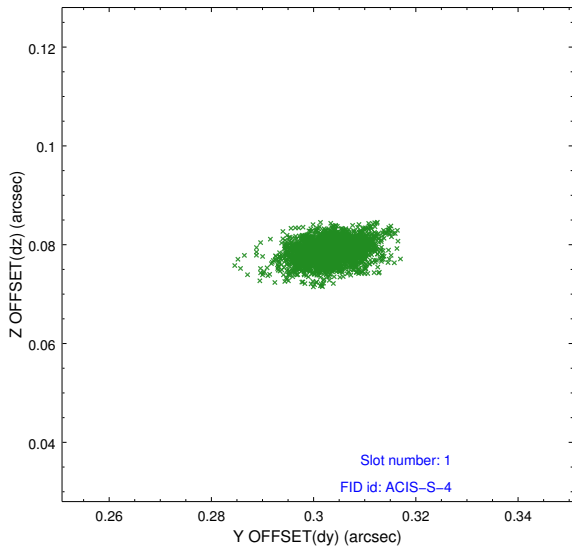


2.5 FID Slots

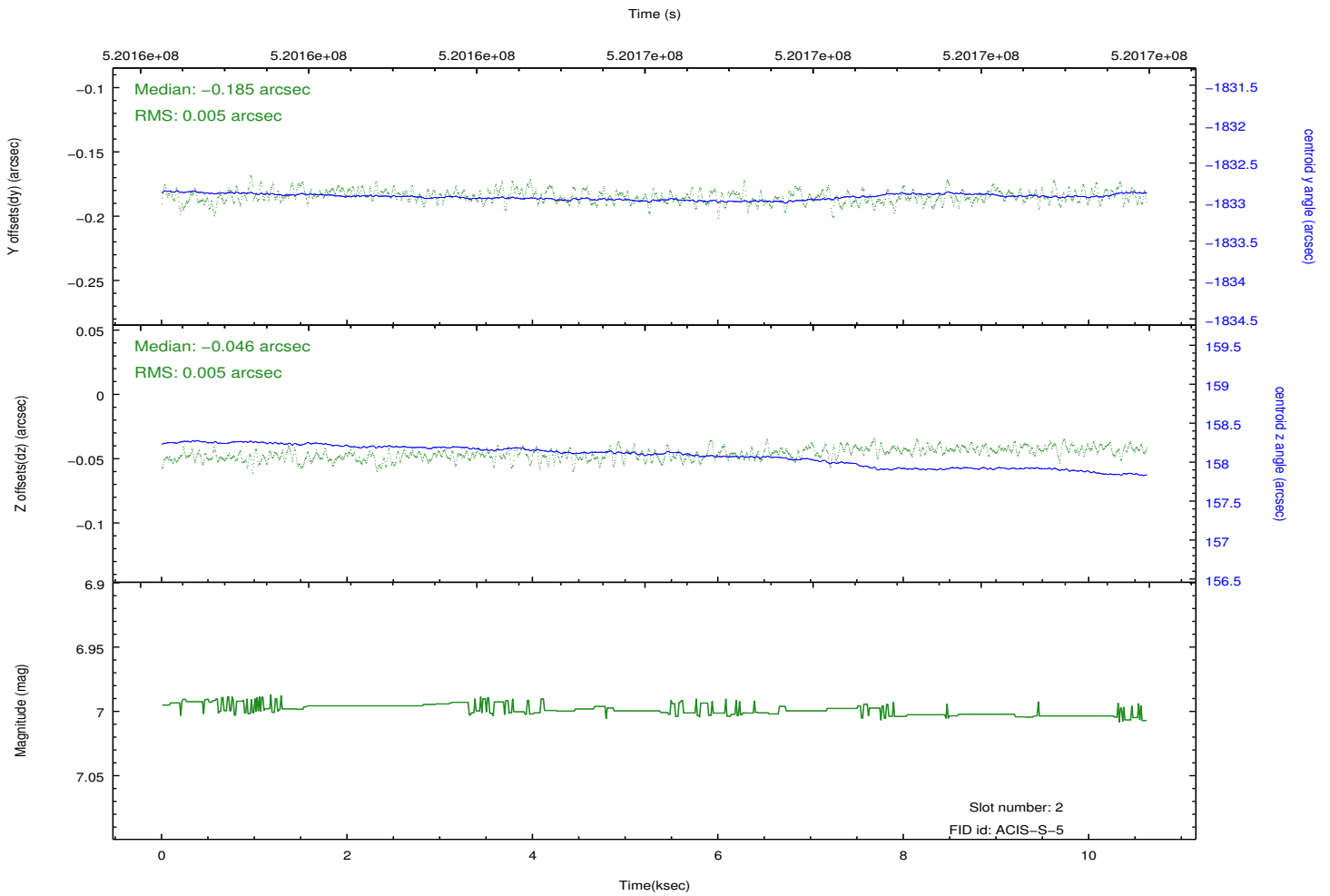
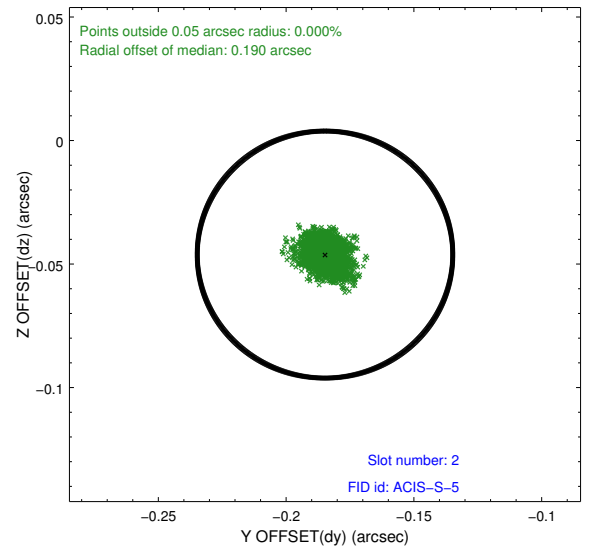
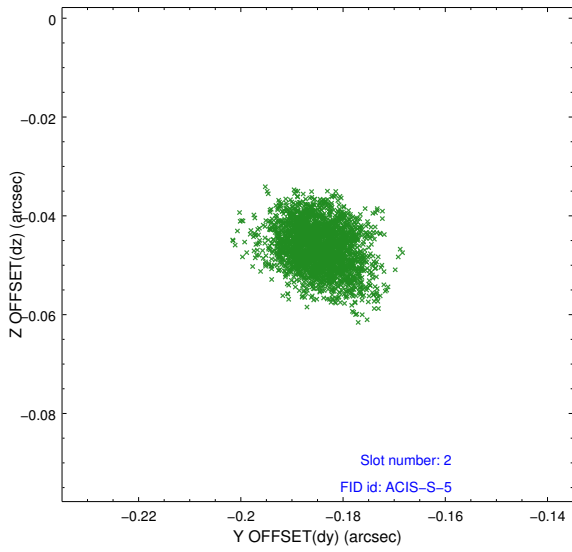
2.5.1 Slot 0



2.5.2 Slot 1

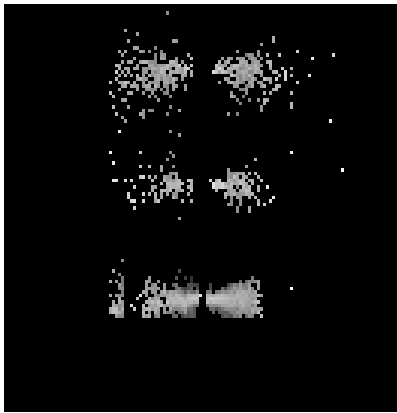


2.5.3 Slot 2

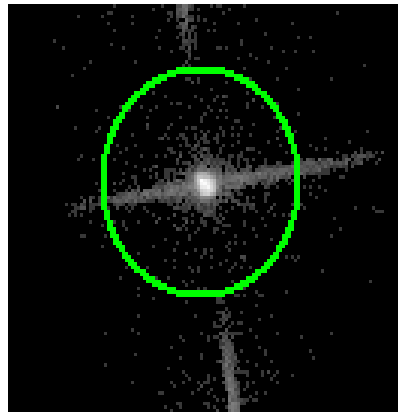


3 Gratings

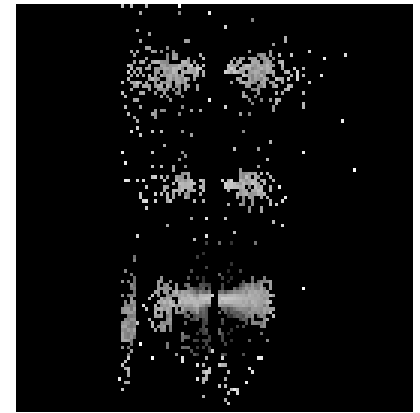
3.1 LETG Arm



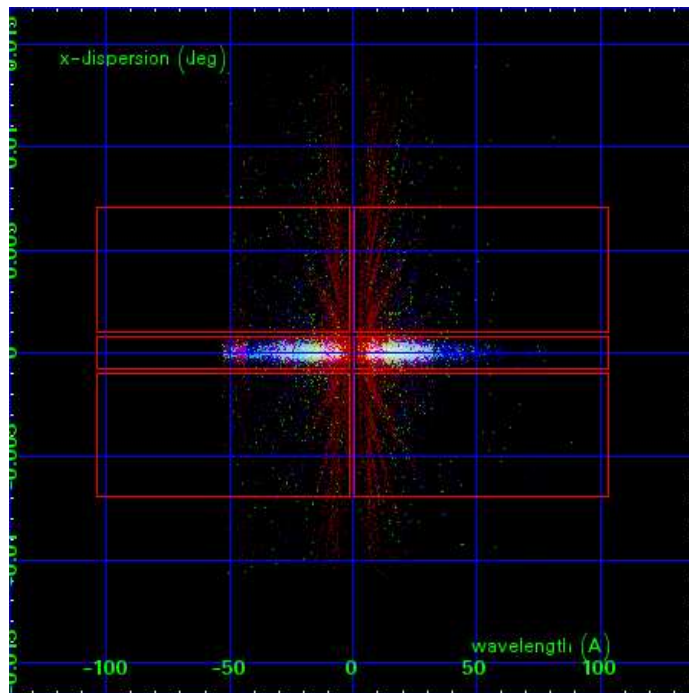
LETG Order Sort 123



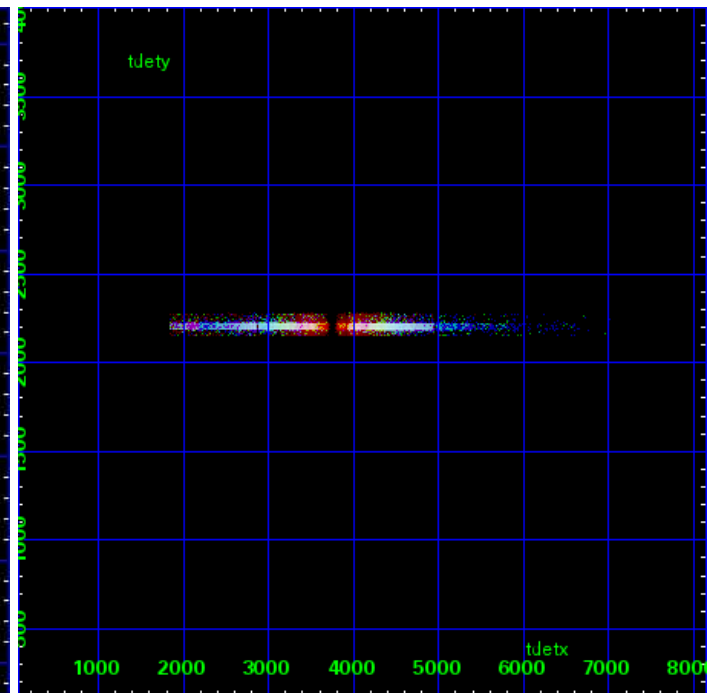
LETG Zero Order



LETG Order Sort ALL

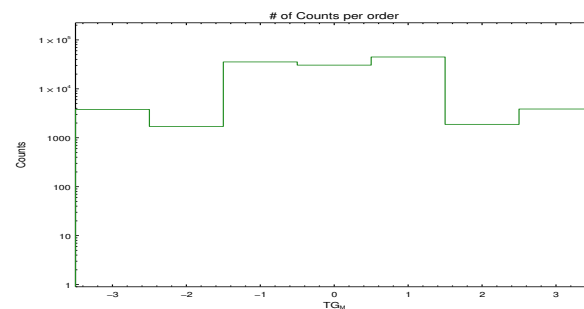


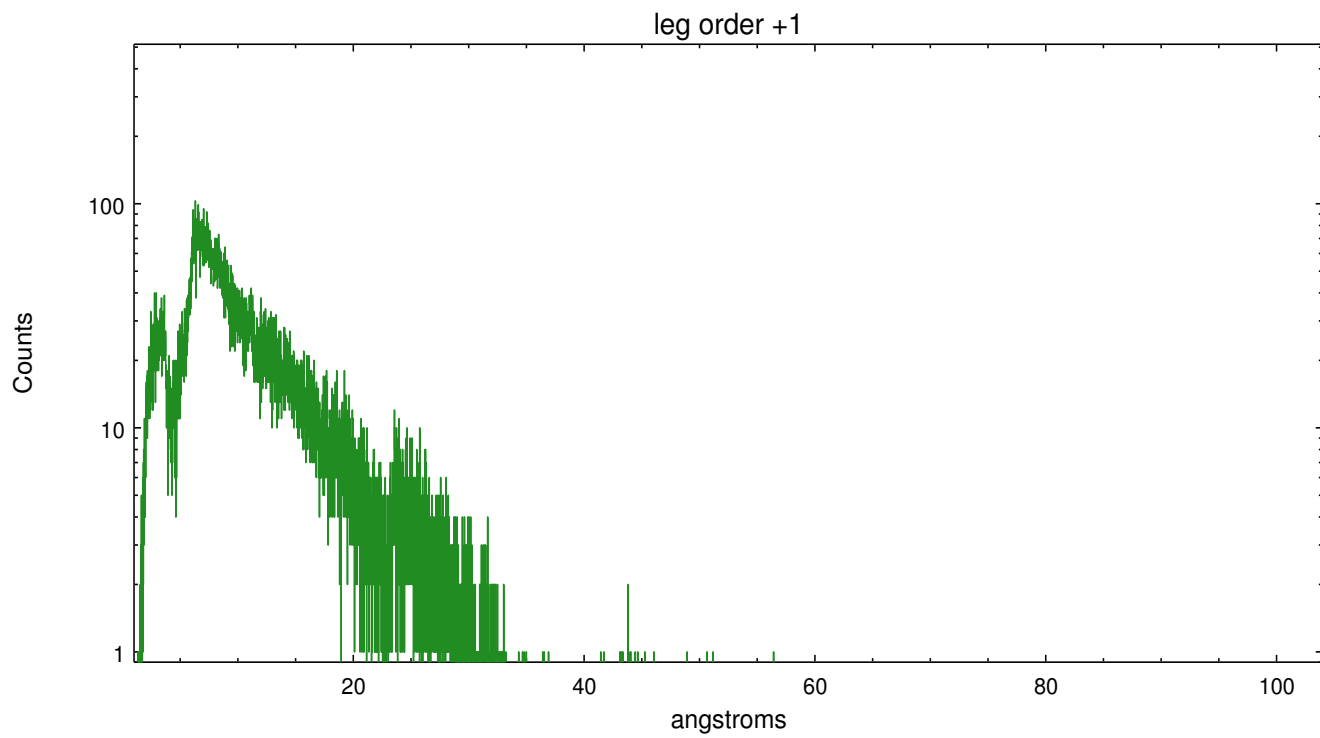
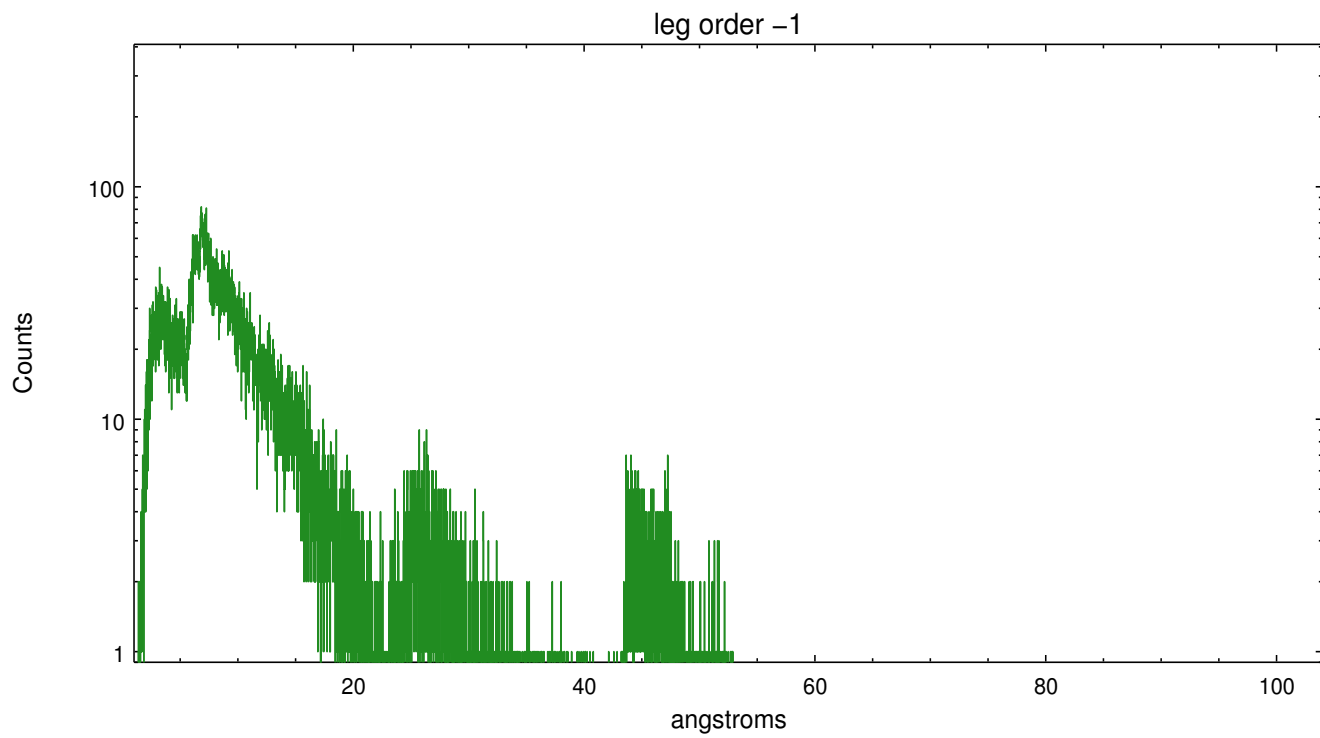
Spot Image LETG



Full Detector LETG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	3779	1704	35474	30494	44754	1877	3867





A Summary

A.1 Status

V&V Scientist	Jen Lauer
V&V Date (YYYY-MM-DD)	2015.11.05
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	10.077199828327

A.2 Comments

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.

=====

Note: offset 3 arcmin off-axis; psf/lsf will be enlarged; no calibration for grating rmfs (lsf) off-axis.

=====

Zeroth order moderately 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 LEG dispersed spectral arm, rather than using a centroid position of the source. The findzero results are more accurate than source centroid in this case.

=====

Gain and CTI correction are not well calibrated on CCD_ID 5 (ACIS-S1). Default order sorting can clip some regions, particularly longward of 30A (first order). User-specified custom processing parameters may be required in tg_resolve_events (osipfile=None, osort_lo, osort_hi ~0.5) though this can allow more zeroth order background at short wavelengths.

=====

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.