

V&V Reference Report

L2 ASCDS Version : 10

Observation 15478 - L2 Version 3
Chandra X-Ray Center

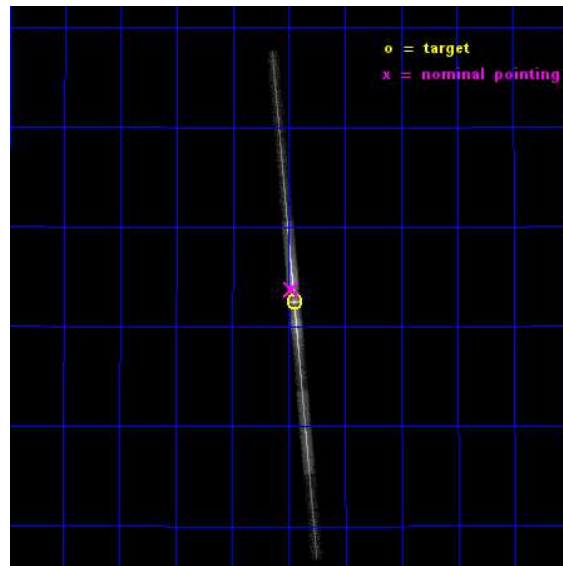
L2 Processing Date : Dec 3 2014

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1 Front

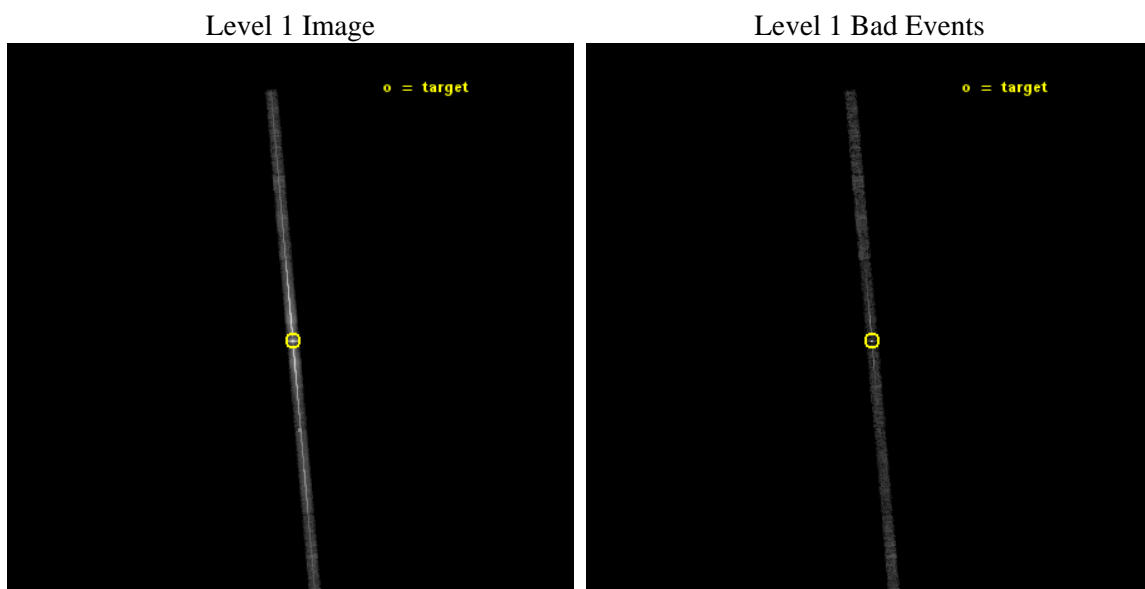
seq_num	790254	Sequence number
obs_id	15478	Observation id
title	AO-14 Calibration Observations of Mkn421	Proposal title
observer	Dr. CXC Calibration	Principal investigator
object	MKN421	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	166.113333	Observer's specified target RA [deg]
dec_targ	38.208806	Observer's specified target Dec [deg]
ra_nom	166.11909055497	Nominal RA [deg]
dec_nom	38.229355069705	Nominal Dec [deg]
roll_nom	264.79577170591	Nominal Roll [deg]
revision	3	Processing version of data
ontime	10064.352868557	Sum of GTIs [s]
livetime	9506.9726438382	Livetime [s]
ontime4	10064.39390856	Sum of GTIs [s]
ontime5	10064.311828554	Sum of GTIs [s]
ontime6	10064.27078855	Sum of GTIs [s]
ontime7	10064.352868557	Sum of GTIs [s]
ontime8	10064.229748547	Sum of GTIs [s]
ontime9	10064.188708544	Sum of GTIs [s]
l2events	317855	Number of level 2 events



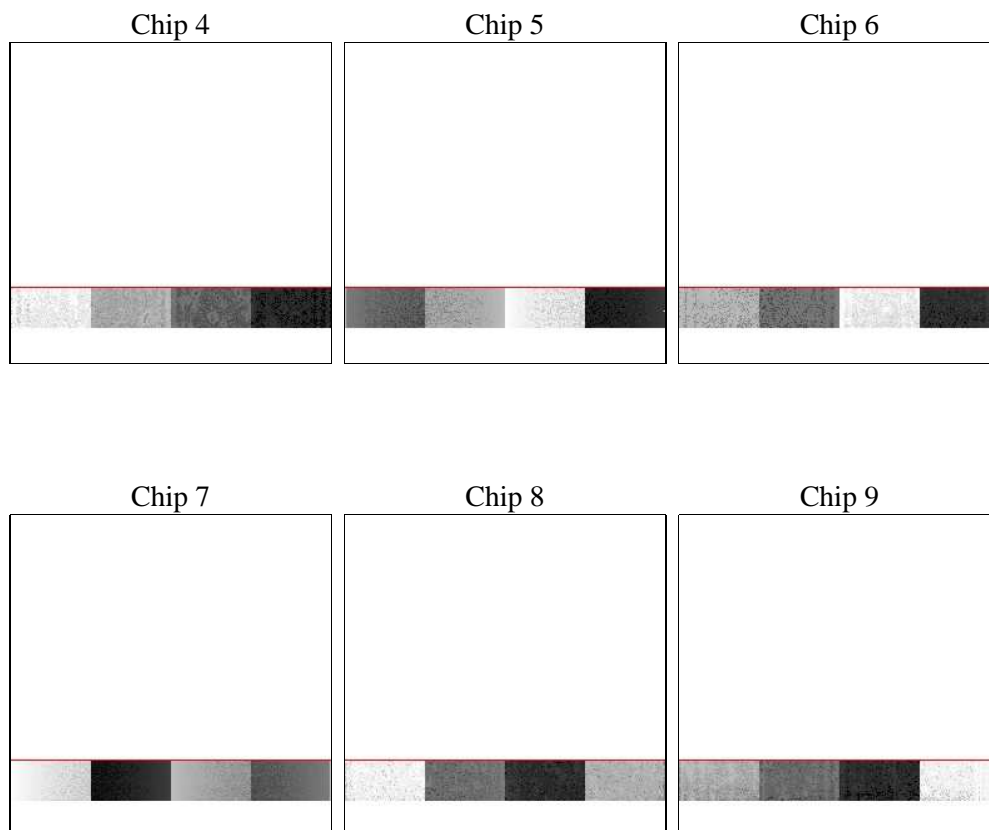
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	10010.000000	[s] Scheduled observation exposure time
ascdsver	10.3	Processing system revision	ontime	10064.352868557	Sum of GTIs [s]
caldsver	4.6.4	 	ontime4	10064.39390856	Sum of GTIs [s]
date	2014-12-04T01:01:10	Date and time of file creation	ontime5	10064.311828554	Sum of GTIs [s]
revision	2	Processing version of data	ontime6	10064.27078855	Sum of GTIs [s]
			ontime7	10064.352868557	Sum of GTIs [s]
			ontime8	10064.229748547	Sum of GTIs [s]
			ontime9	10064.188708544	Sum of GTIs [s]
			l1events	382853	Number of level 1 events
			tgmethod	FINDZO	Method used to create src1a file
			ra_pos	(4127.01 - 3046.10)	src1a sky pixel position

2.1.4 Events

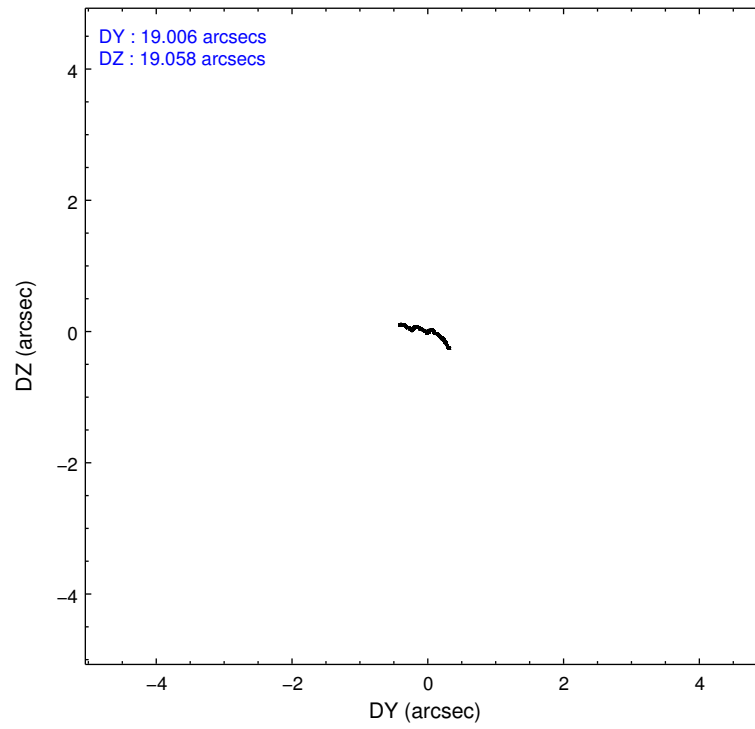
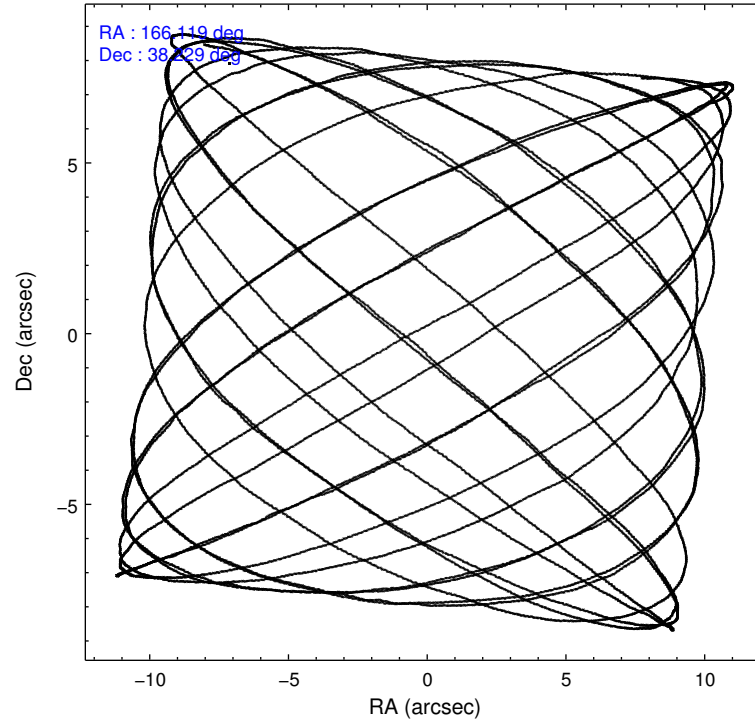
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	11393	31267	117863	192114	19951	10265
rejected events	7297	5340	7589	18945	8178	6191
rejected %	64%	17%	6%	9%	40%	60%

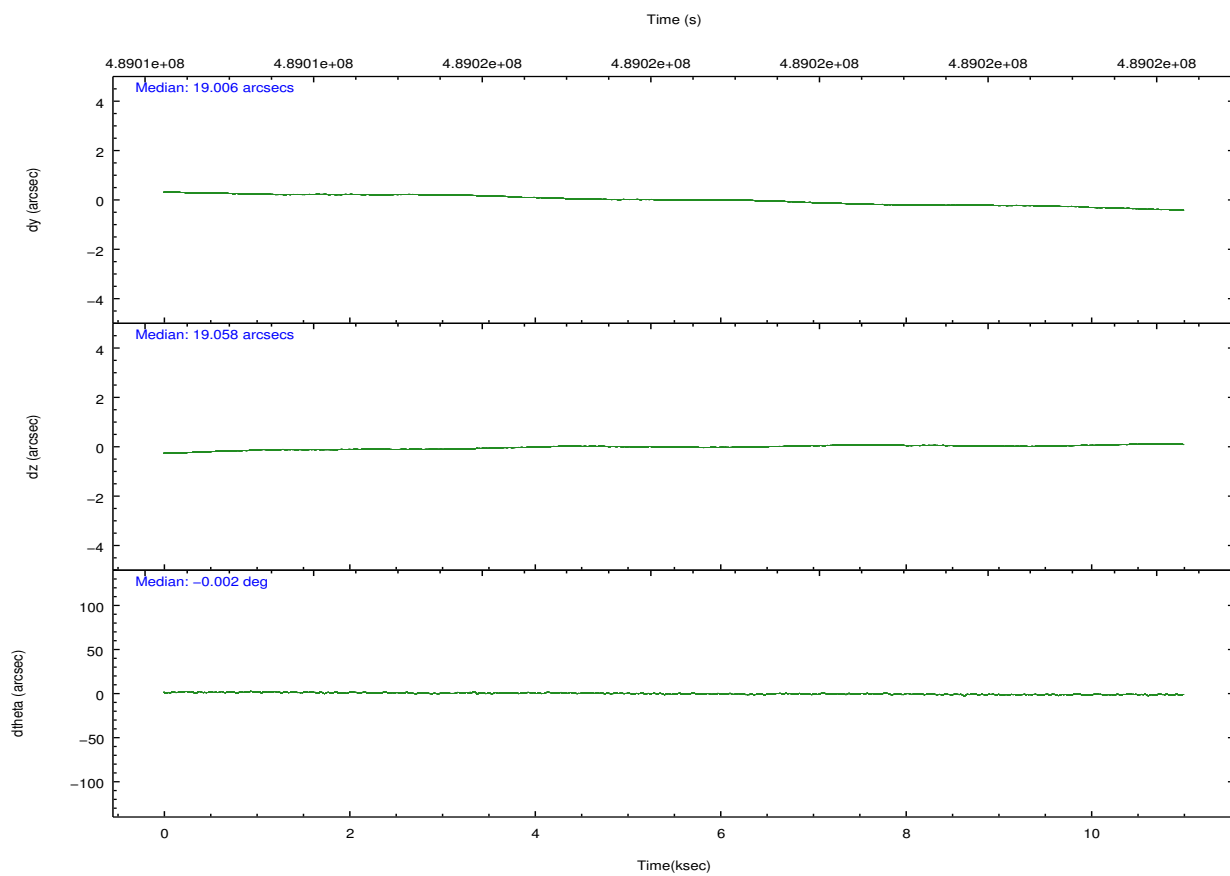
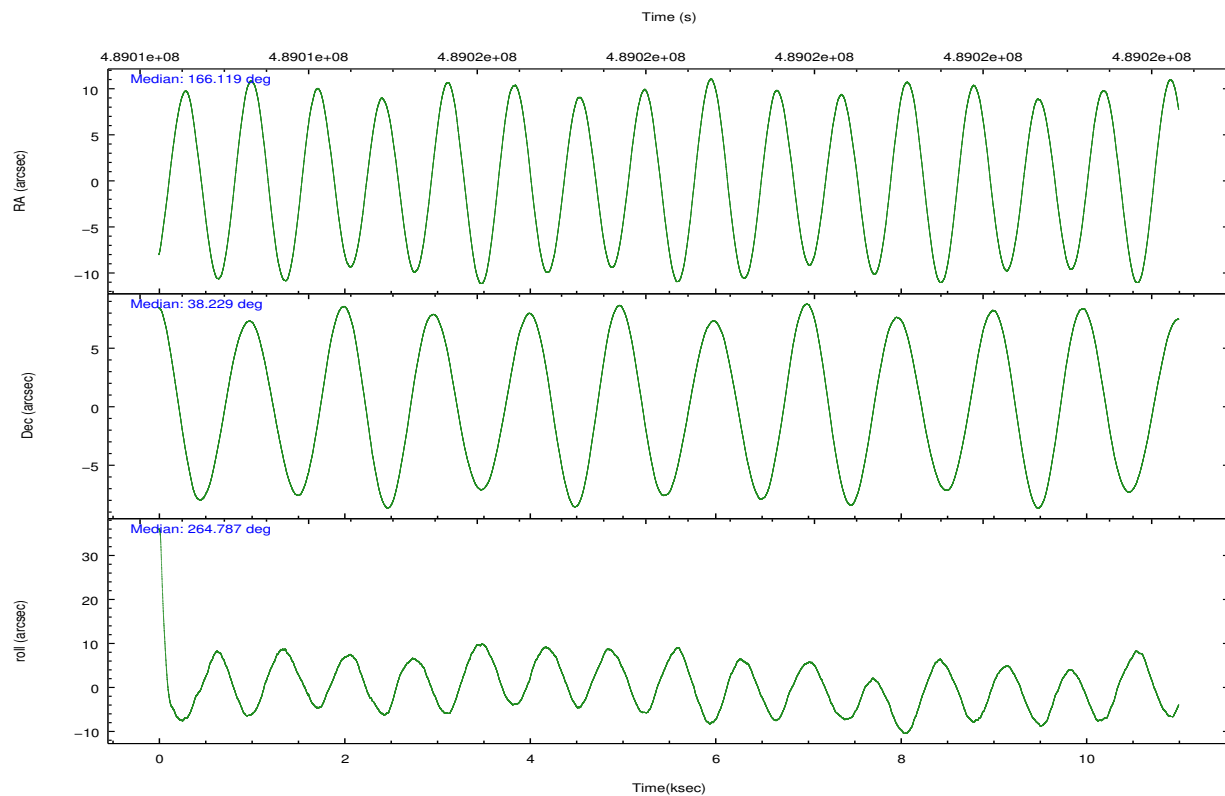
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
grade 0 events	2968	13274	88595	46772	8300	2914
	26%	42%	75%	24%	41%	28%
grade 1 events	6	107	637	877	11	2
	0%	0%	0%	0%	0%	0%
grade 2 events	495	4931	11411	44655	1447	457
	4%	15%	9%	23%	7%	4%
grade 3 events	233	1928	3761	20146	516	248
	2%	6%	3%	10%	2%	2%
grade 4 events	218	1957	3729	19715	523	228
	1%	6%	3%	10%	2%	2%
grade 5 events	297	1044	716	4331	390	297
	2%	3%	0%	2%	1%	2%
grade 6 events	182	3838	2797	41893	991	227
	1%	12%	2%	21%	4%	2%
grade 7 events	6994	4188	6217	13725	7773	5892
	61%	13%	5%	7%	38%	57%

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	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	166.104019	166.1190905549683	CCD I2 on	N	N
[deg] Pointing Dec	38.254017	38.22935506970493	CCD I3 on	N	N
[deg] Pointing Roll	264.648484	264.7957717059089	CCD S0 on	O1	Y
[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	-182.132523	-182.1370004450064	CCD S3 on	Y	Y
[mm] SIM translation stage offset	-8	-7.995522138001405	CCD S4 on	Y	Y
[s] Observation start time (MET)	489013750.184000	489012447.93699	CCD S5 on	Y	Y
Observation start date	2013-06-30T21:08:03	2013-06-30T20:47:27	Number of optional ACIS chips dropped	0	0
[s] Observation end time (MET)	489023760.184000	489023983.80012	On-chip summing requested	N	N
Observation end date	2013-06-30T23:54:53	2013-06-30T23:59:43	Subarray requested	CUSTOM	1/8
Read mode	TIMED	TIMED	Subarray start row	113	113
			Subarray row count	128	128
			Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	0.7

2.3 Aspect



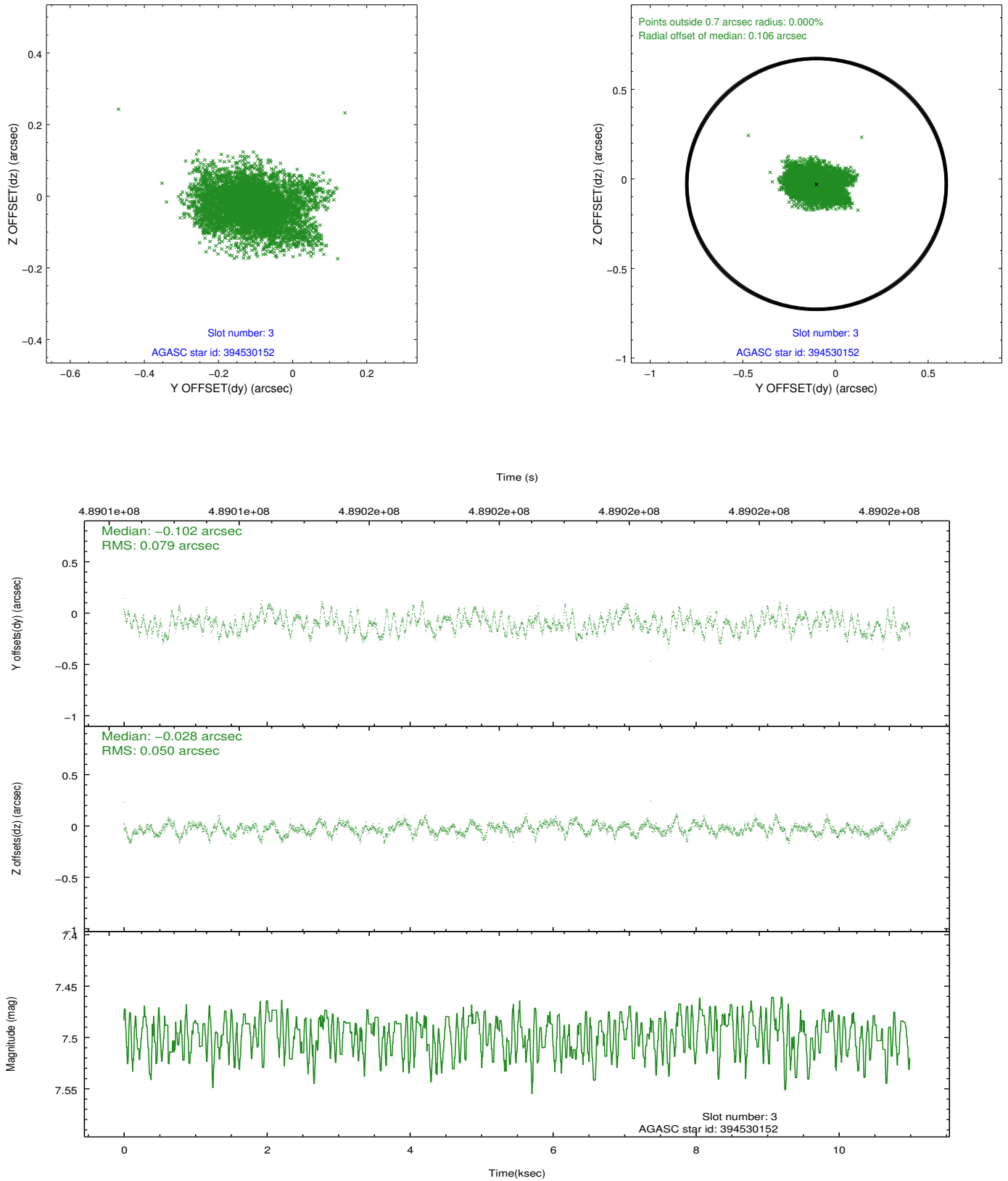


Slot Statistics

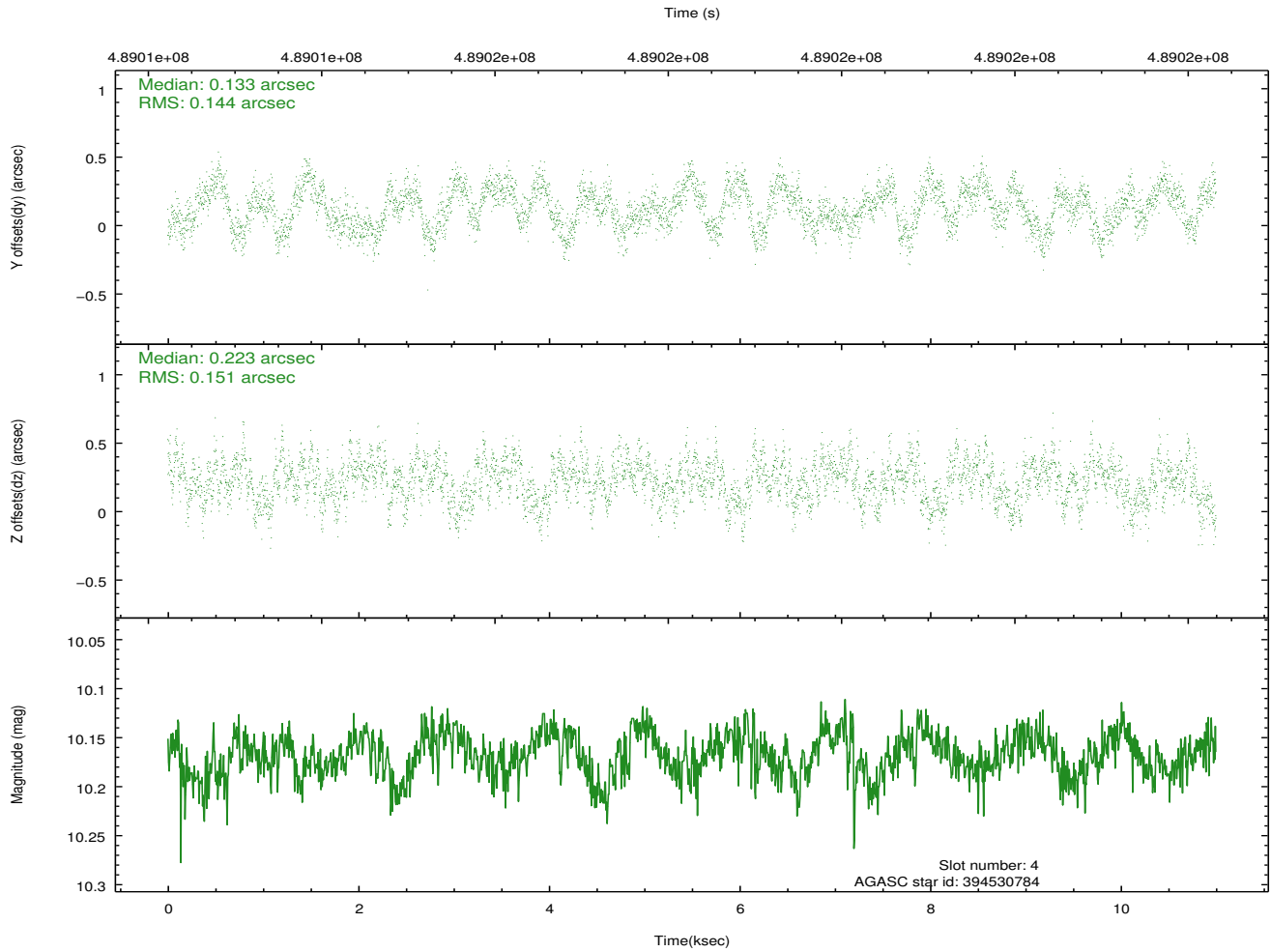
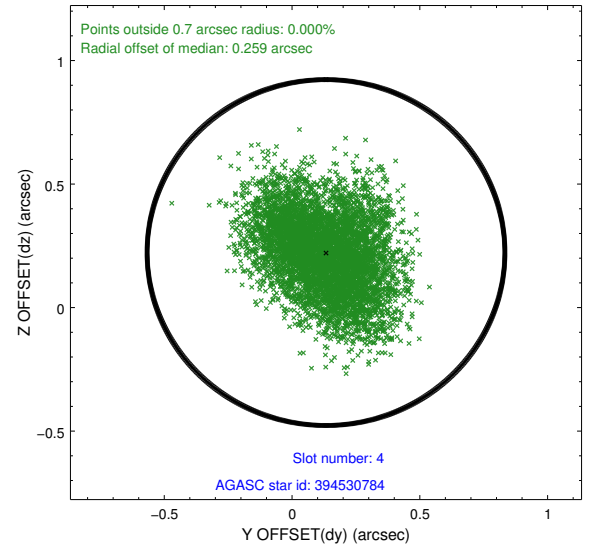
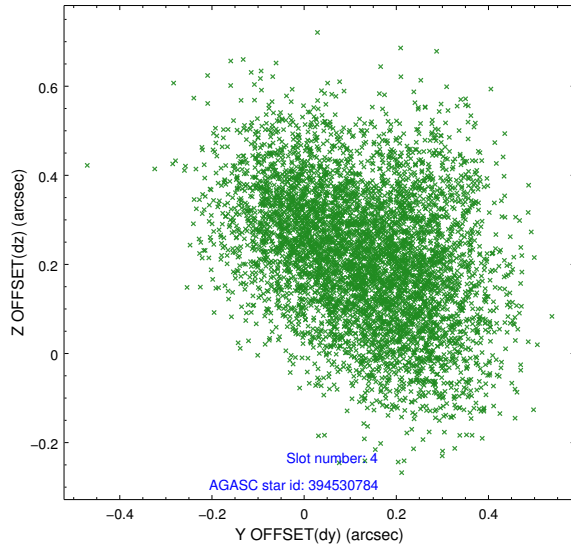
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-S-2	6.97	2683	-0.203	-0.118	0.011	0.018	0.000000	0.000000	-771.77	-1905.33
1	FID		ACIS-S-4	7.04	2683	0.189	0.138	0.010	0.017	0.000000	0.000000	2141.75	2.75
2	FID		ACIS-S-6	7.26	2683	-0.013	-0.012	0.008	0.015	0.000000	0.000000	391.09	640.59
3	GUIDE	used	394530152	7.50	5366	-0.102	-0.028	0.101	0.163	166.075805	38.868252	-2193.93	-284.91
4	GUIDE	used	394530784	10.17	5333	0.133	0.223	0.225	0.352	165.569172	38.418674	-453.52	-1557.13
5	GUIDE	used	394533848	8.72	5364	0.112	0.041	0.108	0.176	166.382906	38.276007	-153.62	772.80
6	GUIDE	used	394543960	9.80	5357	0.091	-0.194	0.135	0.217	165.802757	37.787371	1751.71	-696.21
7	GUIDE	used	394546712	6.61	5365	-0.226	-0.036	0.098	0.163	166.451462	38.394357	-595.62	927.93

2.4 Star Slots

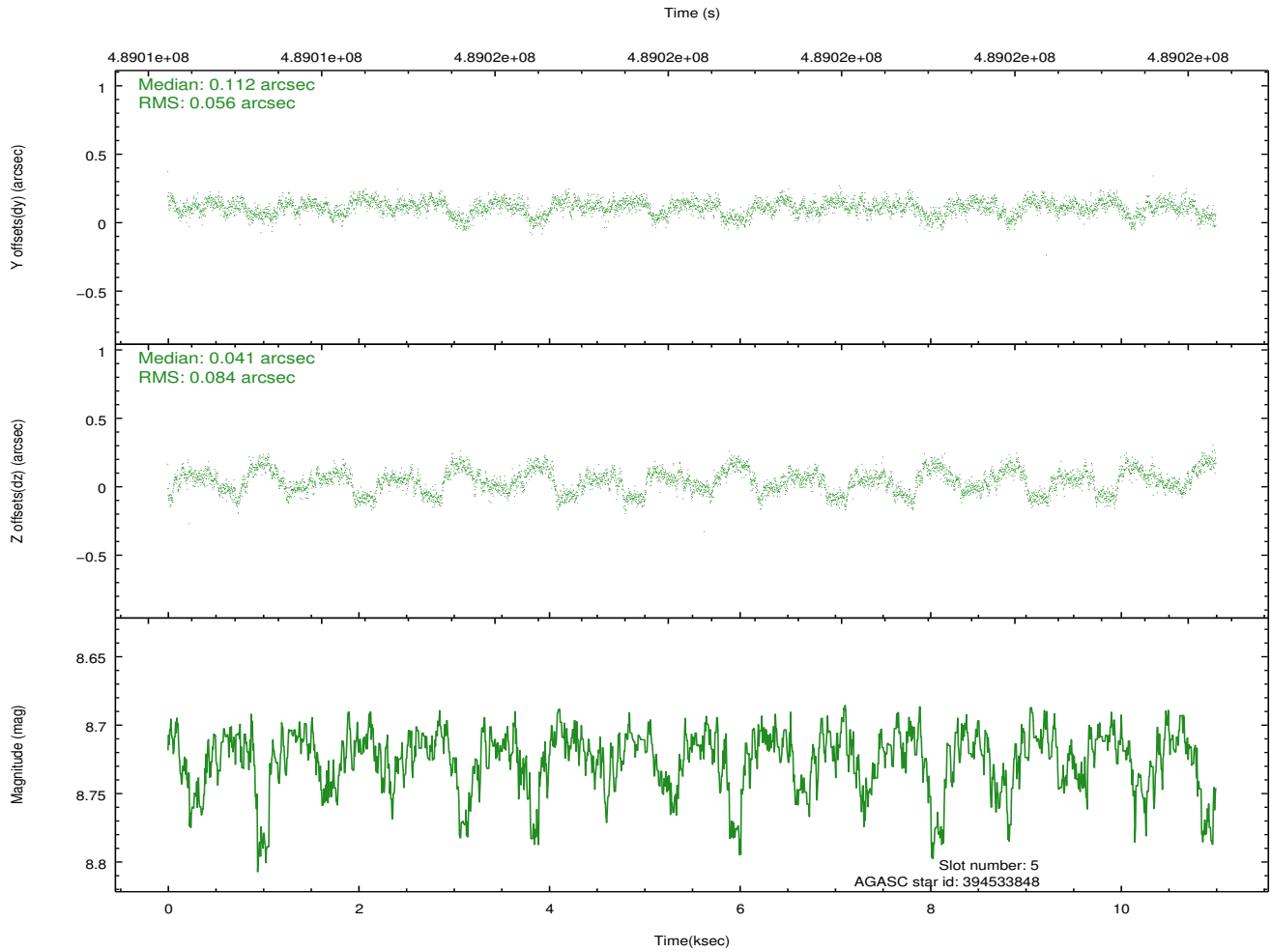
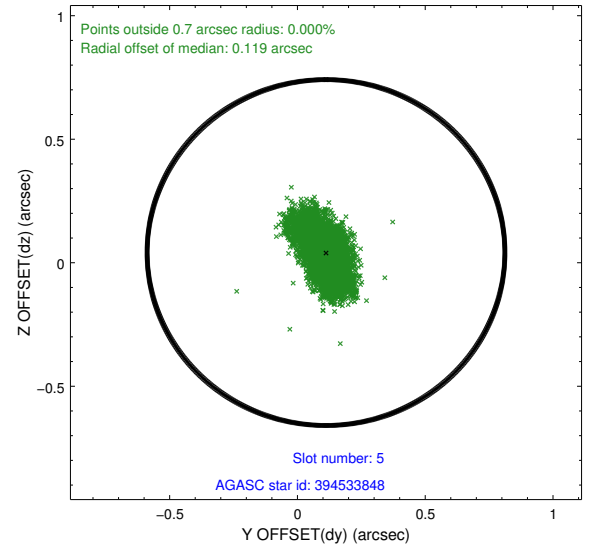
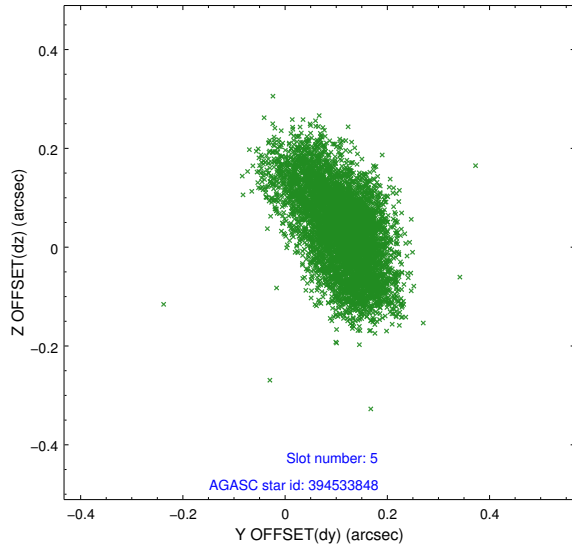
2.4.1 Slot 3



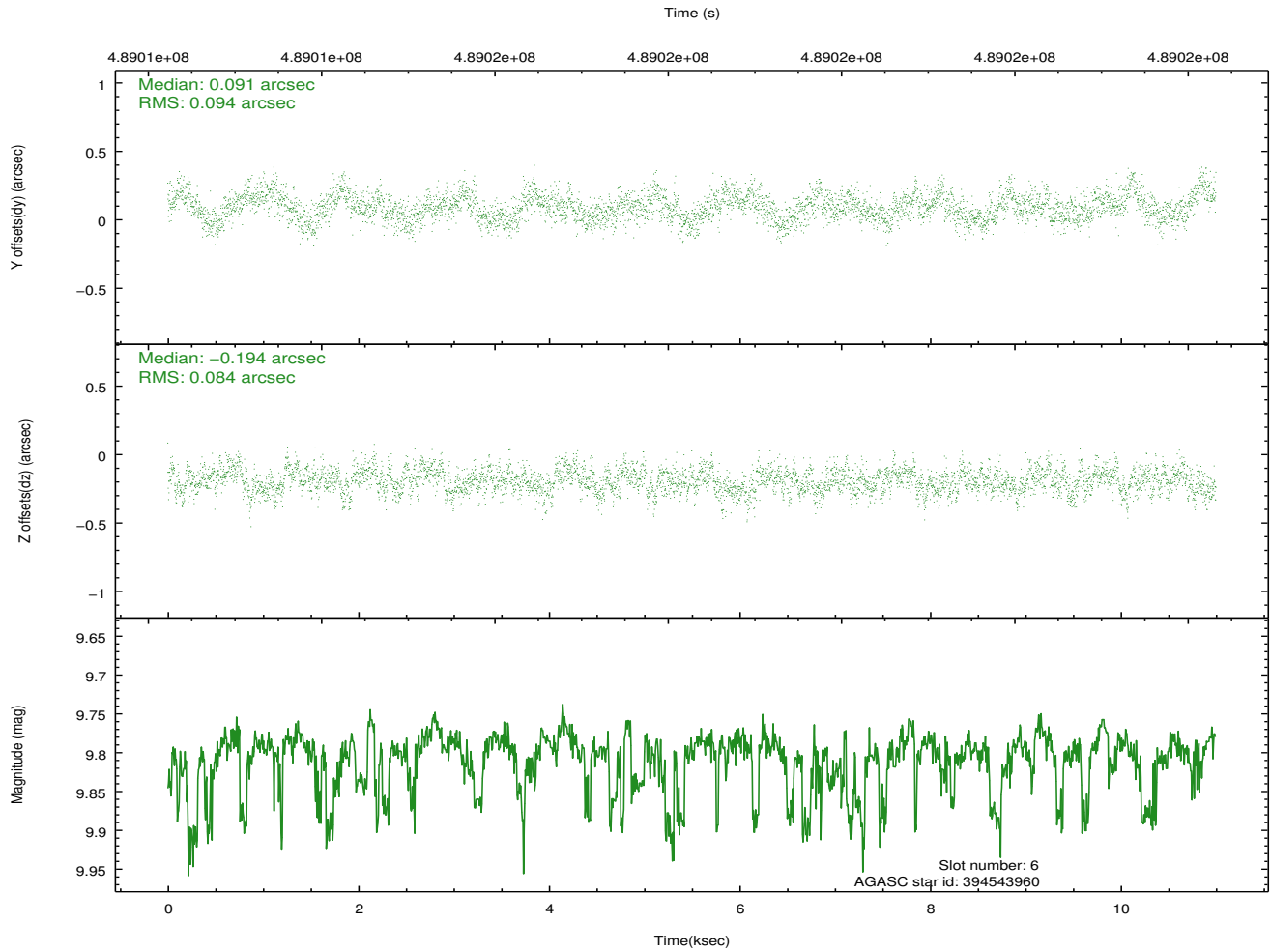
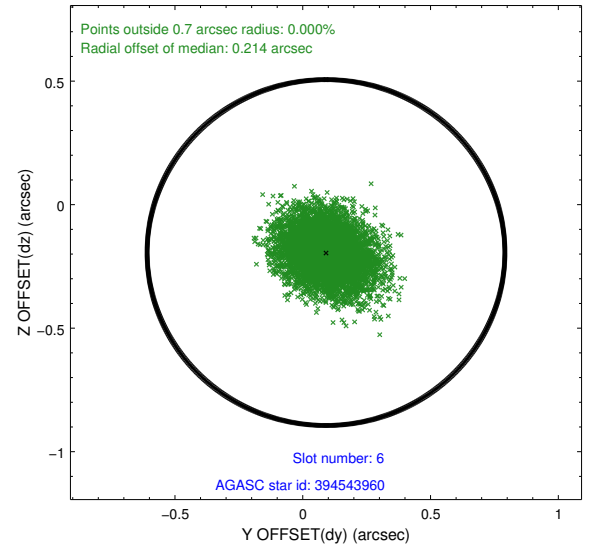
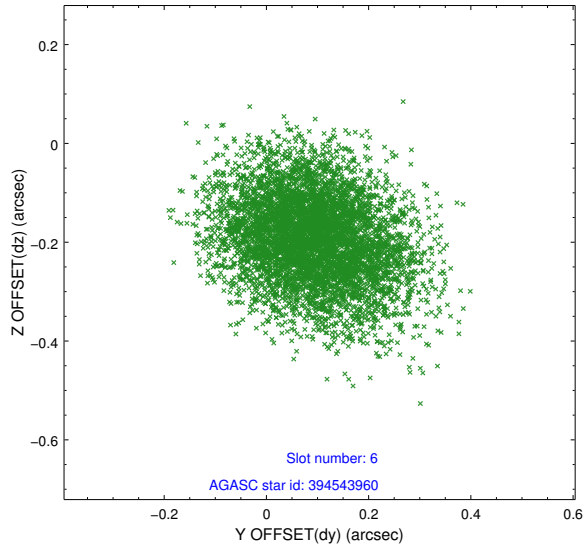
2.4.2 Slot 4



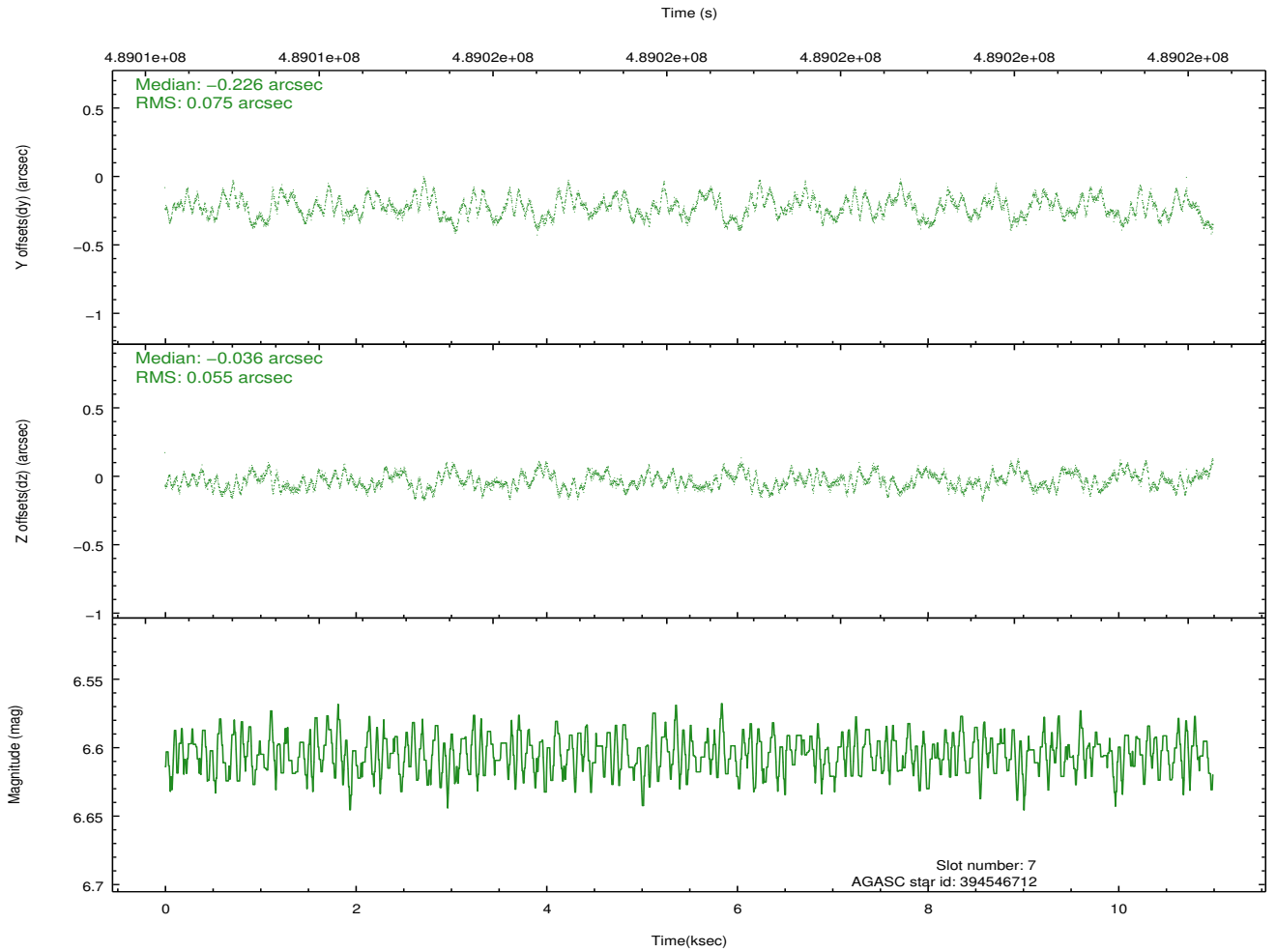
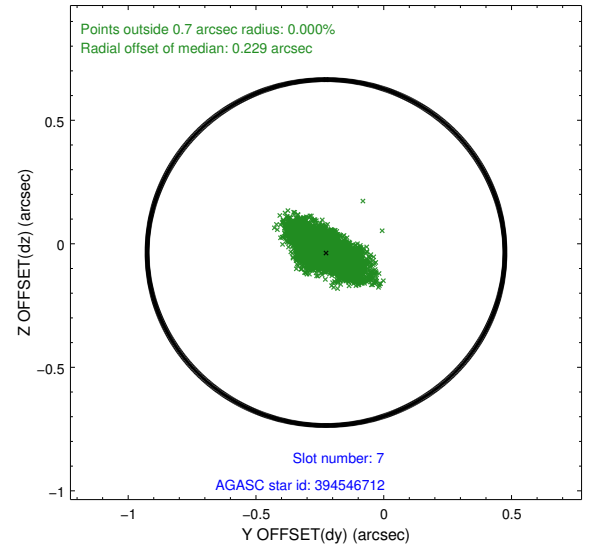
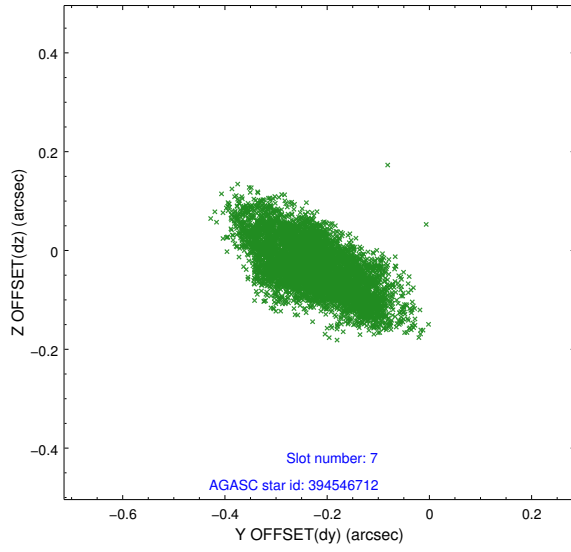
2.4.3 Slot 5



2.4.4 Slot 6

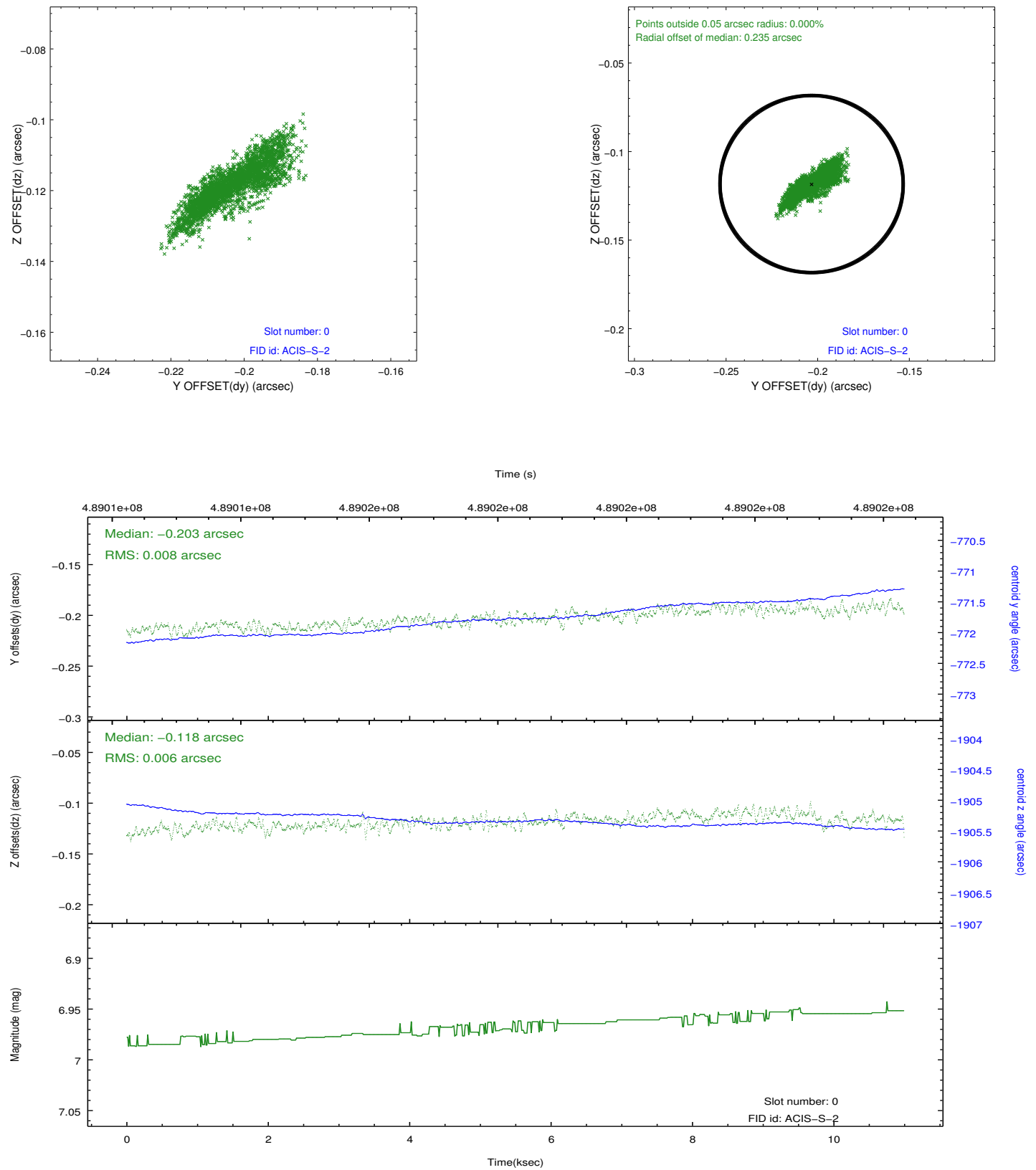


2.4.5 Slot 7

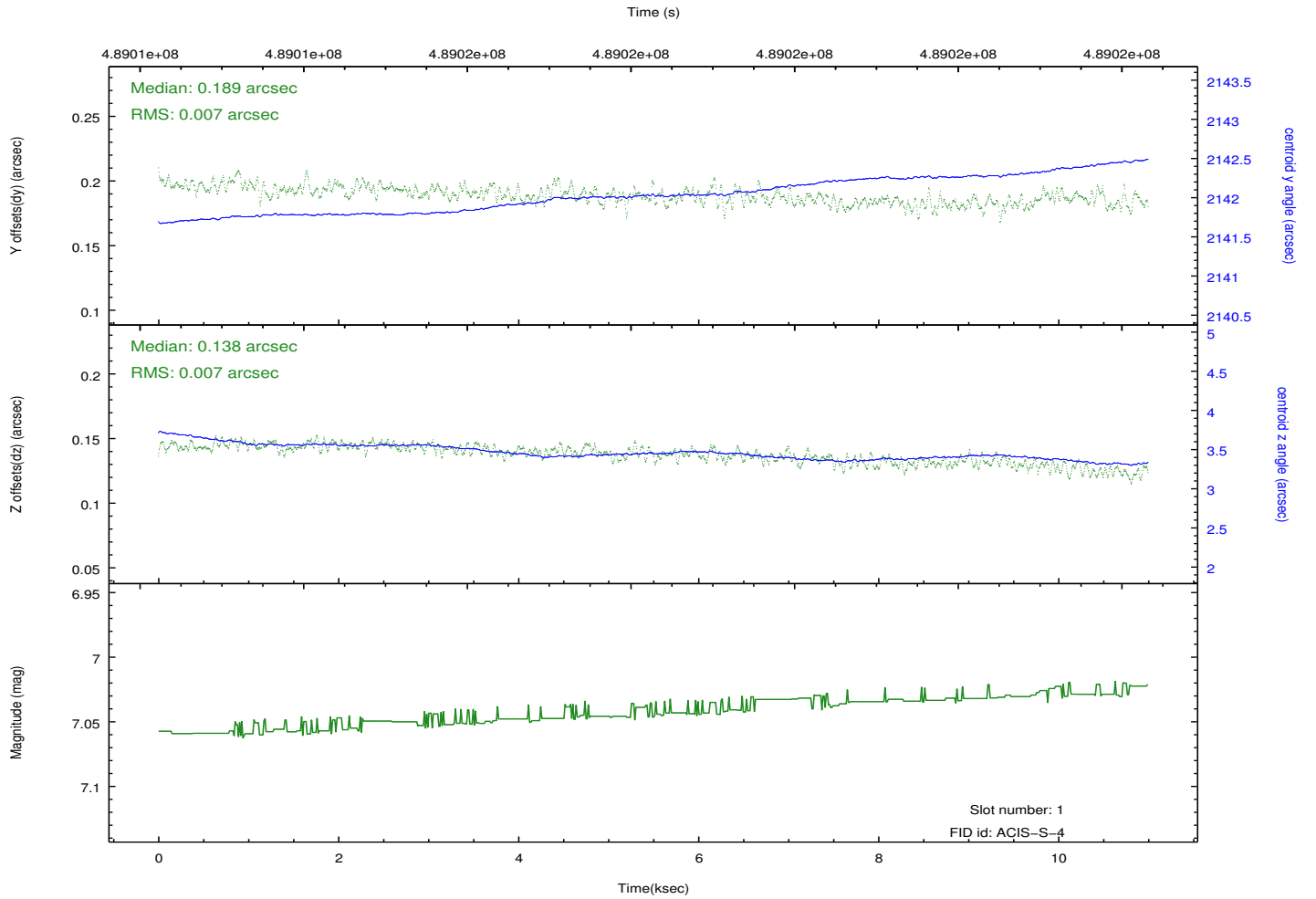
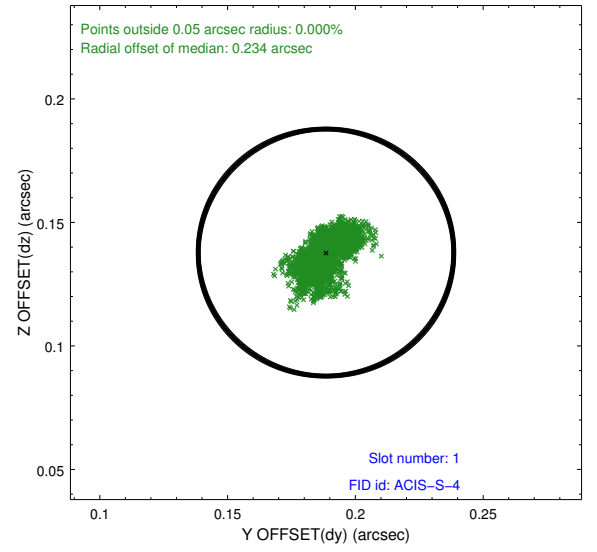
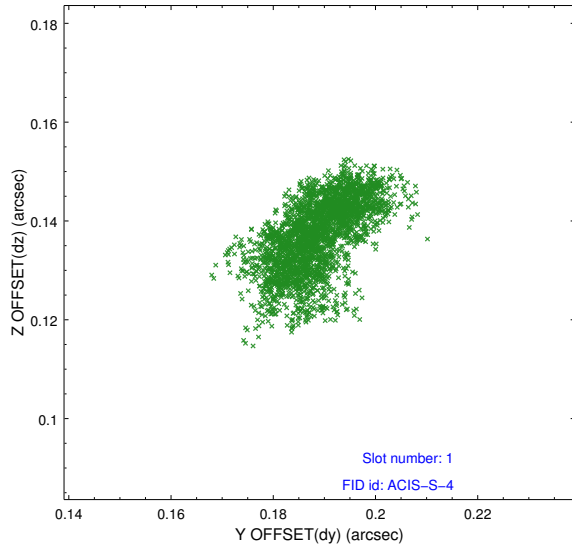


2.5 FID Slots

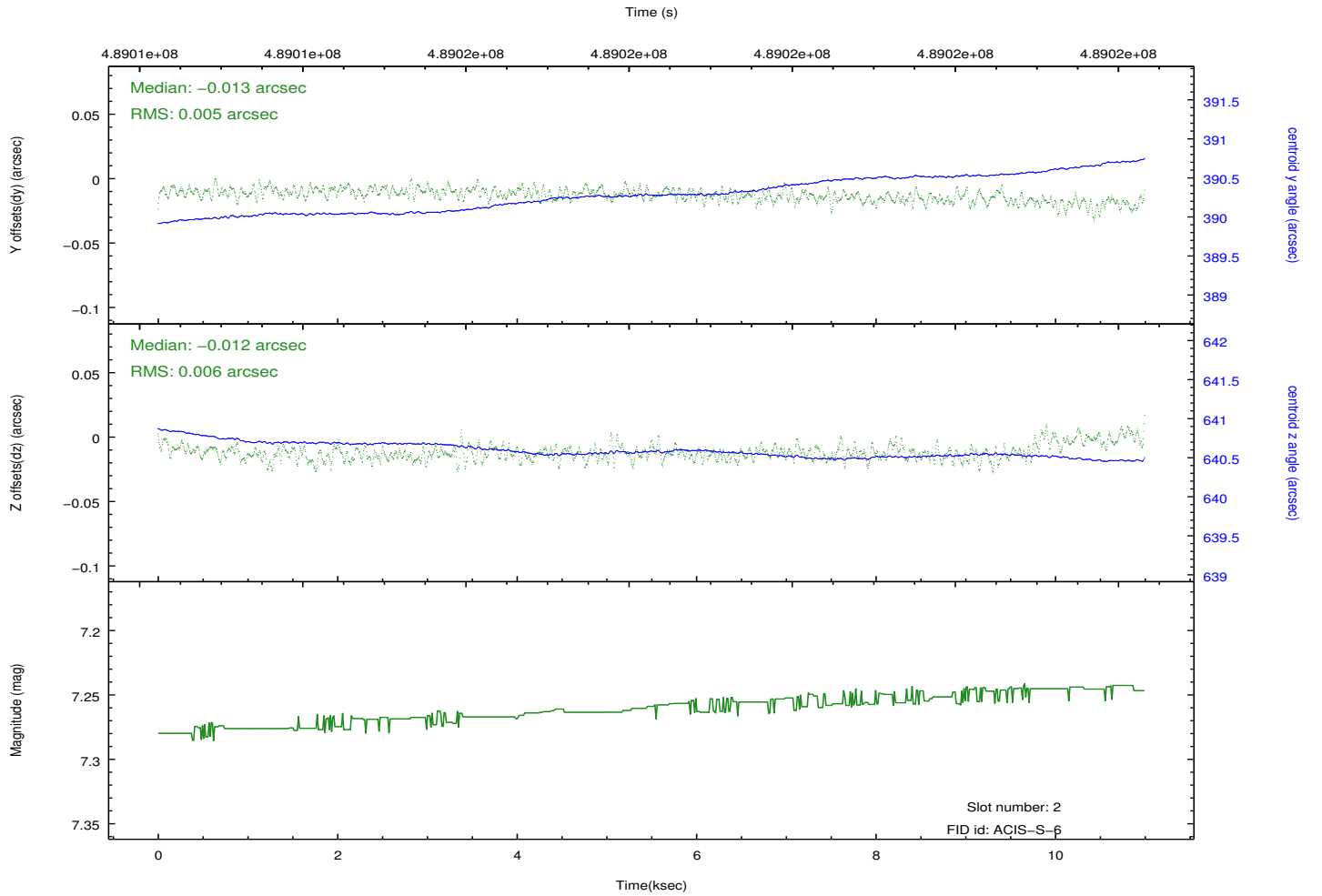
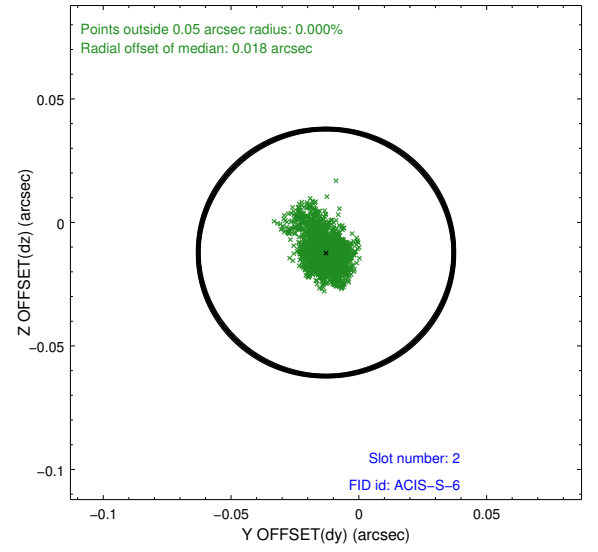
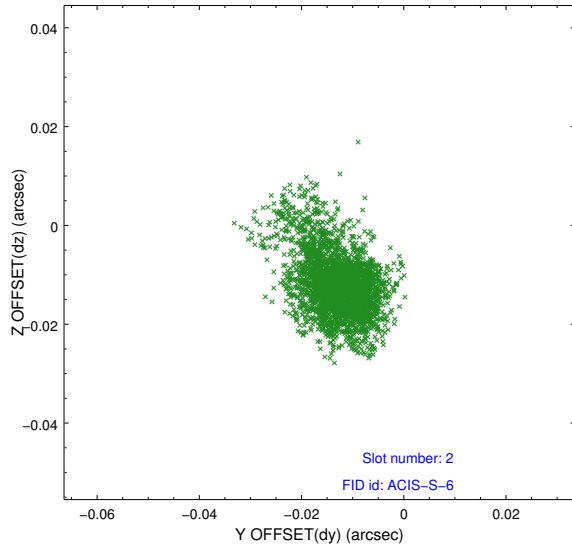
2.5.1 Slot 0



2.5.2 Slot 1



2.5.3 Slot 2

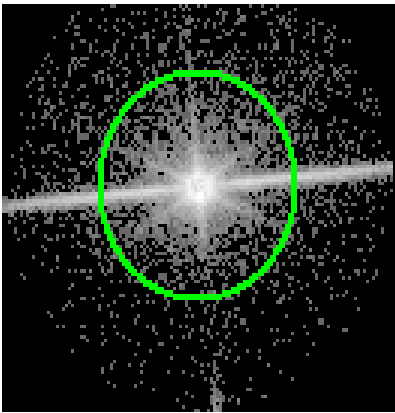


3 Gratings

3.1 LETG Arm



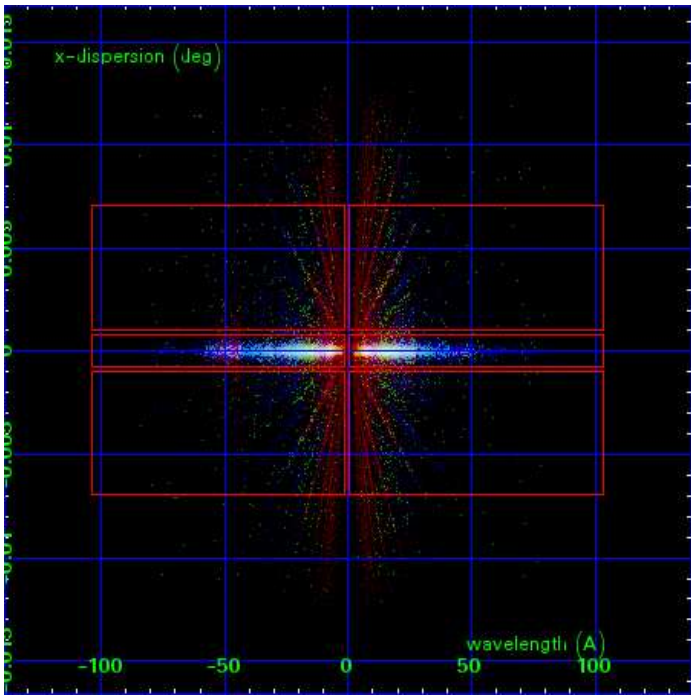
LETG Order Sort 123



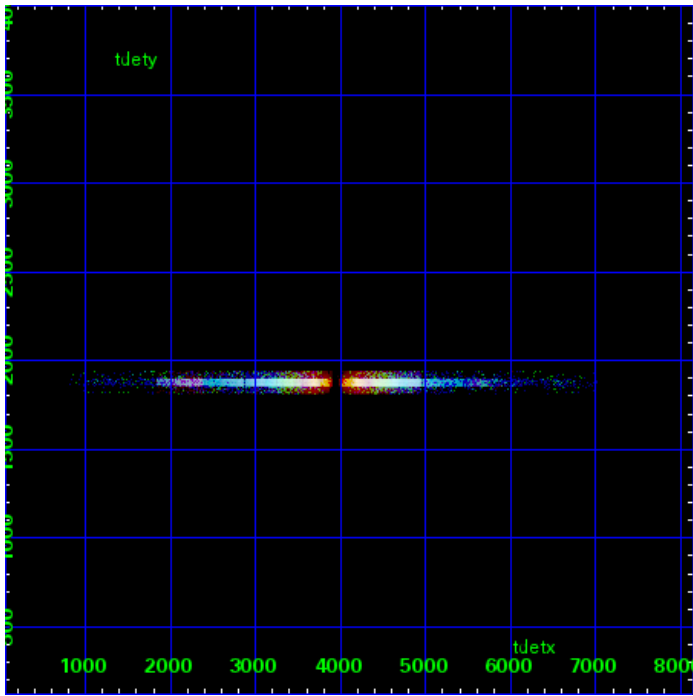
LETG Zero Order



LETG Order Sort ALL

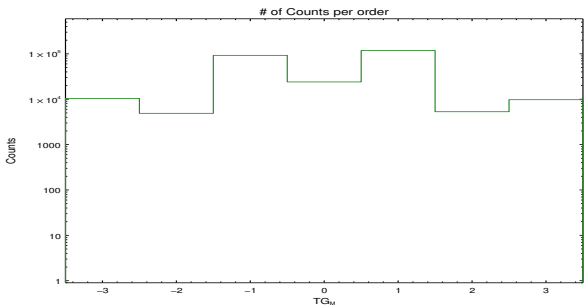


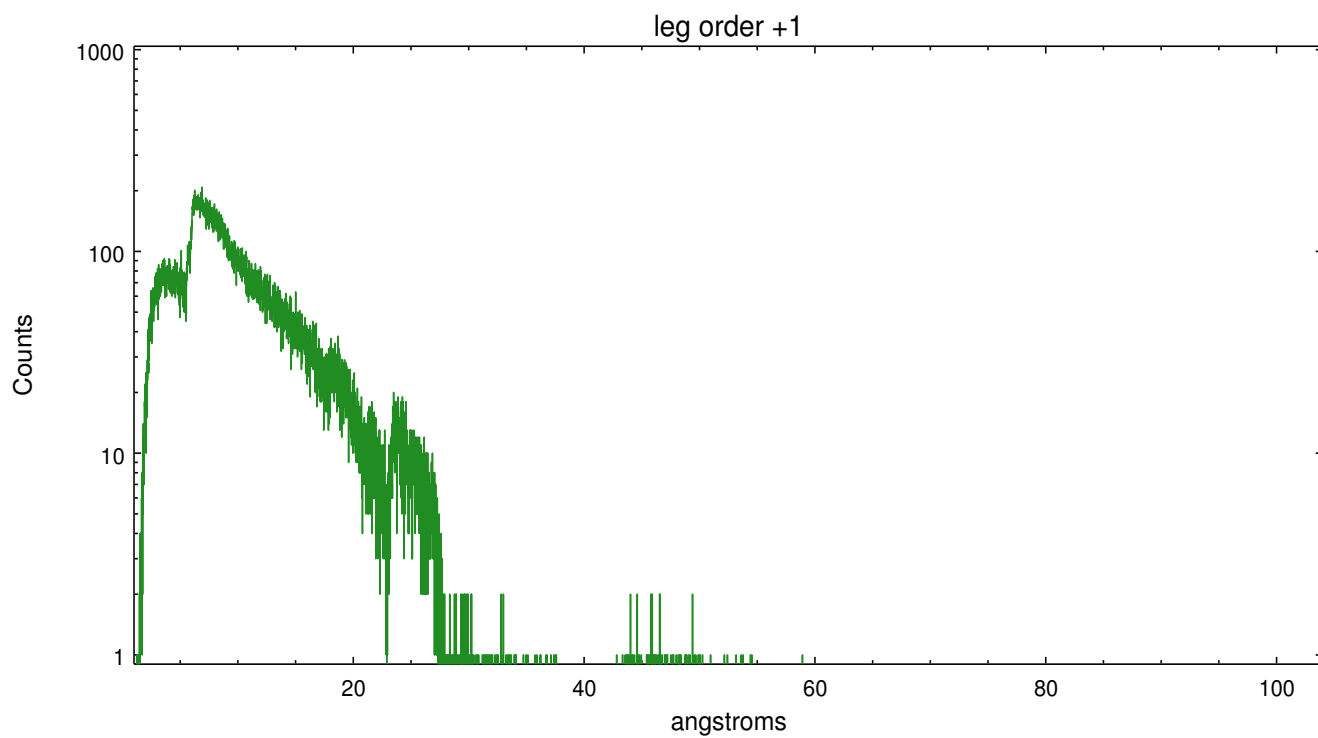
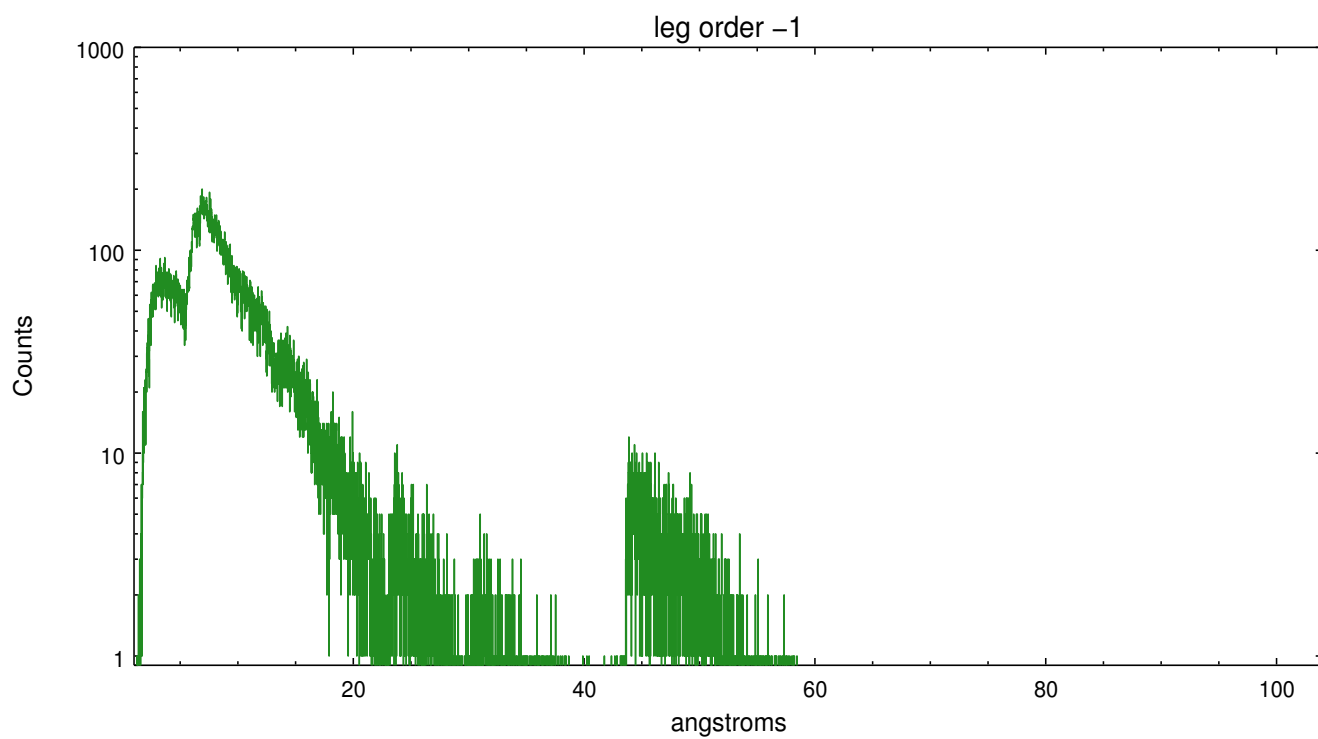
Spot Image LETG



Full Detector LETG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	10408	4886	92619	24053	118551	5306	9768





A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2015.11.03
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	10.064352868557

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.

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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.

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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.