

V&V Reference Report

L2 ASCDS Version : 10.6

Observation 20983 - L2 Version 1
Chandra X-Ray Center

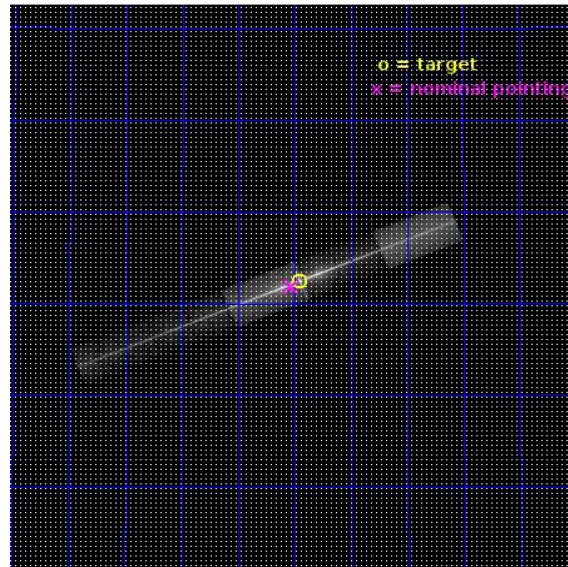
L2 Processing Date : Feb 26 2018

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1 Front

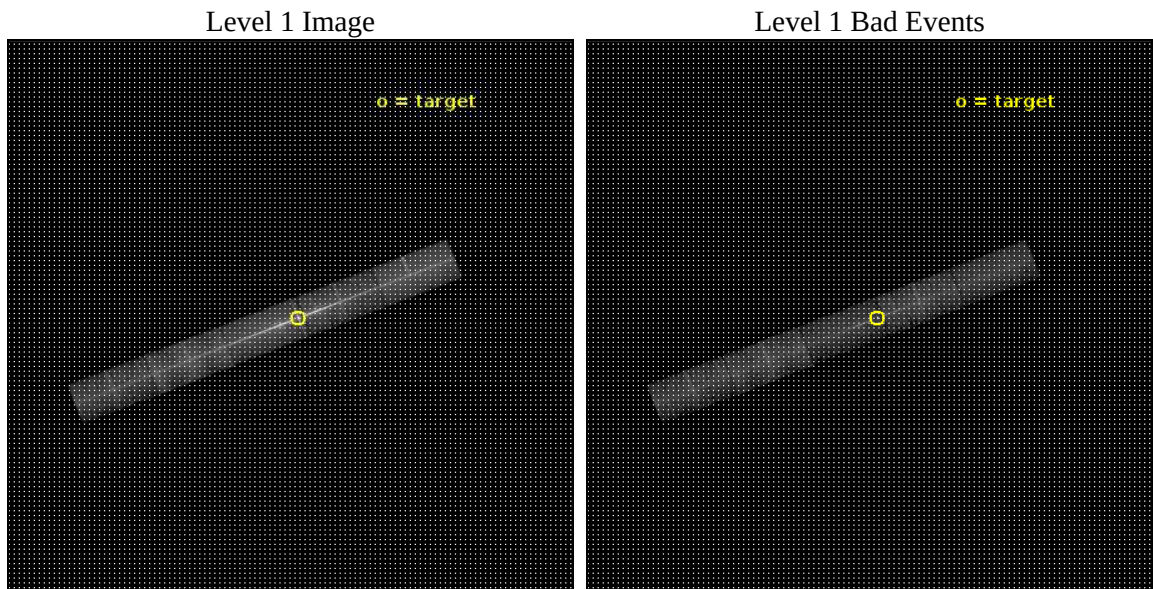
seq_num	790317	Sequence number
obs_id	20983	Observation id
title	AO-19 Big Dither Observation of Mkn421	Proposal title
observer	CXC Calibration	Principal investigator
object	MKN421	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	166.113333	Observer's specified target RA [deg]
dec_targ	38.208806	Observer's specified target Dec [deg]
ra_nom	166.13216506692	Nominal RA [deg]
dec_nom	38.197865978528	Nominal Dec [deg]
roll_nom	158.14501302989	Nominal Roll [deg]
revision	1	Processing version of data
ontime	23076.900500298	Sum of GTIs [s]
livetime	22246.8892855	Livetime [s]
ontime5	23076.900500298	Sum of GTIs [s]
ontime6	23076.900500298	Sum of GTIs [s]
ontime7	23076.900500298	Sum of GTIs [s]
ontime8	23076.900500298	Sum of GTIs [s]
ontime9	23076.900500298	Sum of GTIs [s]
l2events	424379	Number of level 2 events



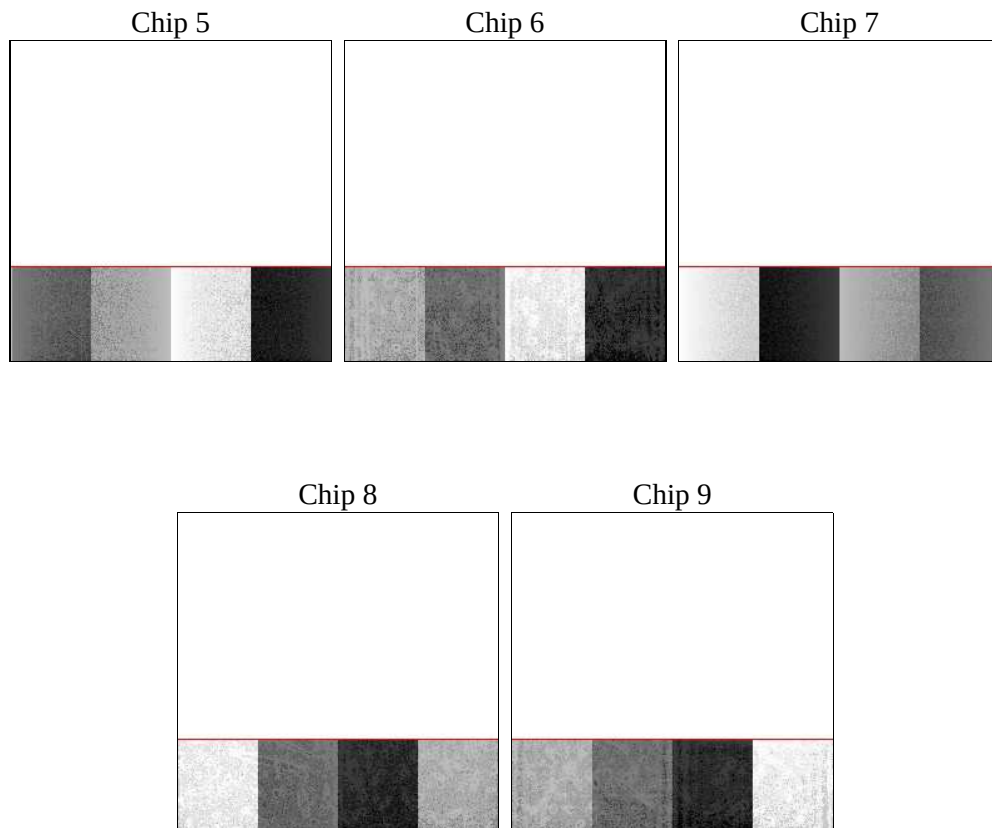
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	23000.000000	[s] Scheduled observation exposure time
ascdsver	10.6	Processing system revision	ontime	23076.900500298	Sum of GTIs [s]
caldbver	4.7.7	 	ontime5	23076.900500298	Sum of GTIs [s]
date	2018-02-26T13:11:18	Date and time of file creation	ontime6	23076.900500298	Sum of GTIs [s]
revision	1	Processing version of data	ontime7	23076.900500298	Sum of GTIs [s]
			ontime8	23076.900500298	Sum of GTIs [s]
			ontime9	23076.900500298	Sum of GTIs [s]
			l1events	704897	Number of level 1 events
			tgmethod	FINDZO	Method used to create src1a file
			zo_pos	(4199.82, 4177.44)	src1a sky pixel position
					src1a sky pixel position via

2.1.4 Events

	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	98230	187647	279824	83658	55538
rejected events	40622	51964	57889	54080	45822
rejected %	41%	27%	20%	64%	82%

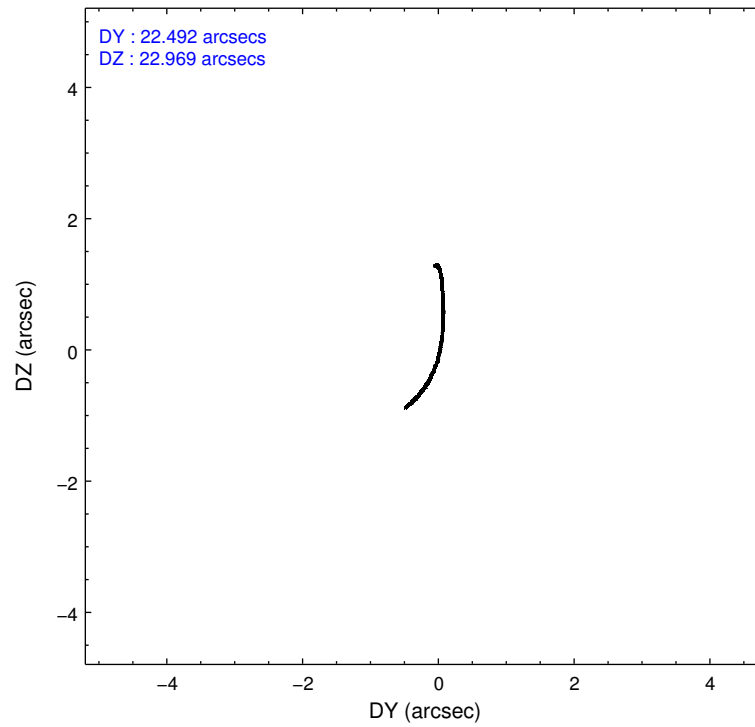
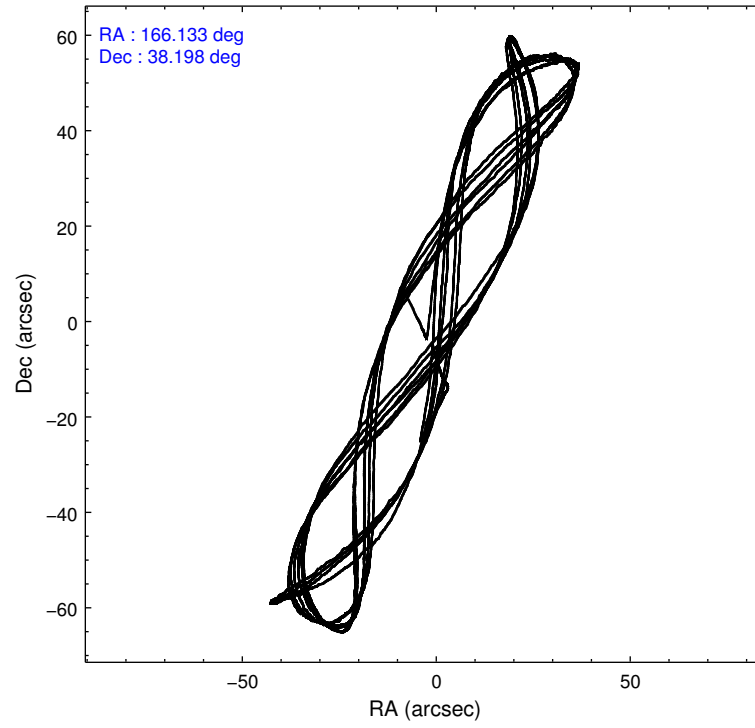
	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
grade 0 events	15015	102885	47480	12651	4712
	15%	54%	16%	15%	8%
grade 1 events	145	793	1169	46	28
	0%	0%	0%	0%	0%
grade 2 events	14273	16054	54751	5407	1727
	14%	8%	19%	6%	3%
grade 3 events	3460	5667	24765	2846	964
	3%	3%	8%	3%	1%
grade 4 events	3371	5733	24206	2554	905
	3%	3%	8%	3%	1%
grade 5 events	6701	2758	11593	3322	2393
	6%	1%	4%	3%	4%
grade 6 events	21494	5351	70737	6139	1410
	21%	2%	25%	7%	2%
grade 7 events	33771	48406	45123	50693	43399
	34%	25%	16%	60%	78%

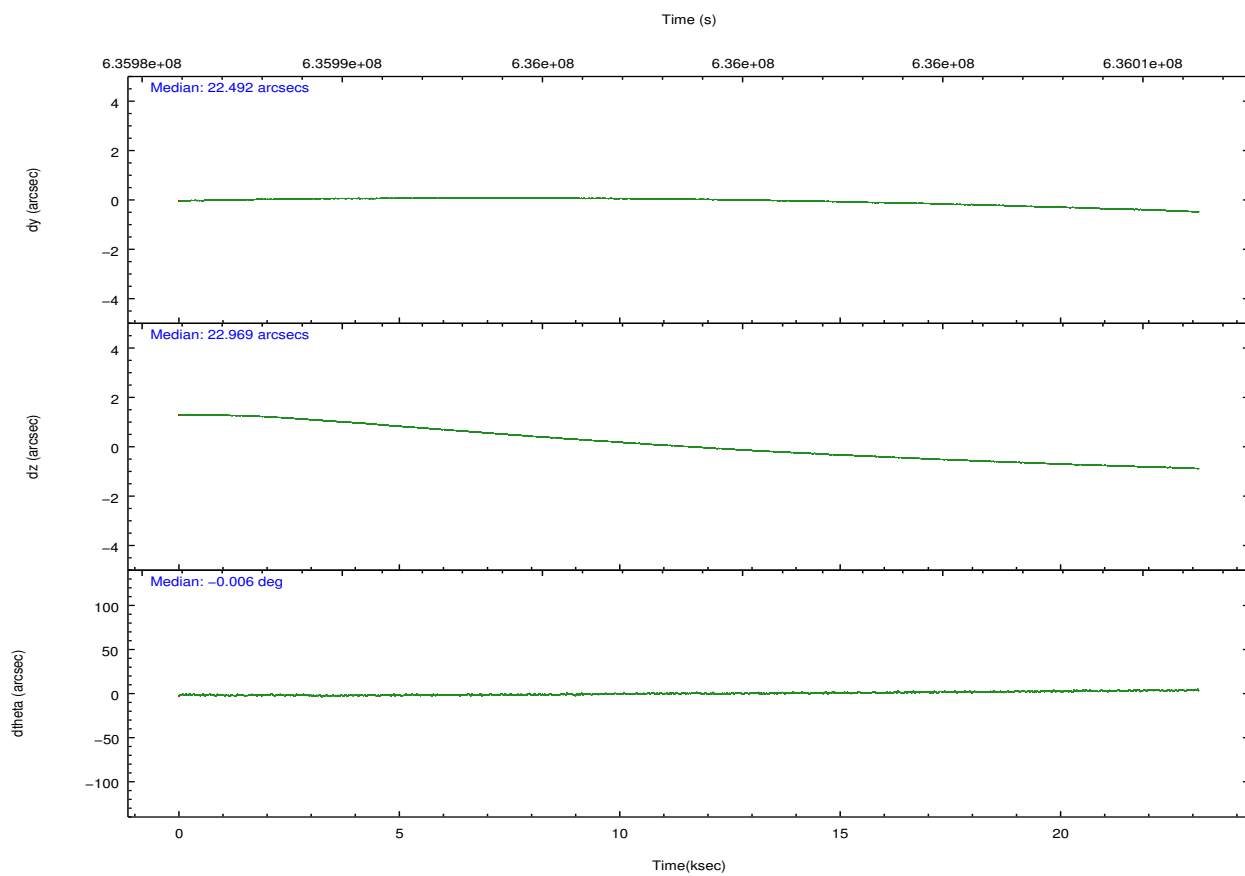
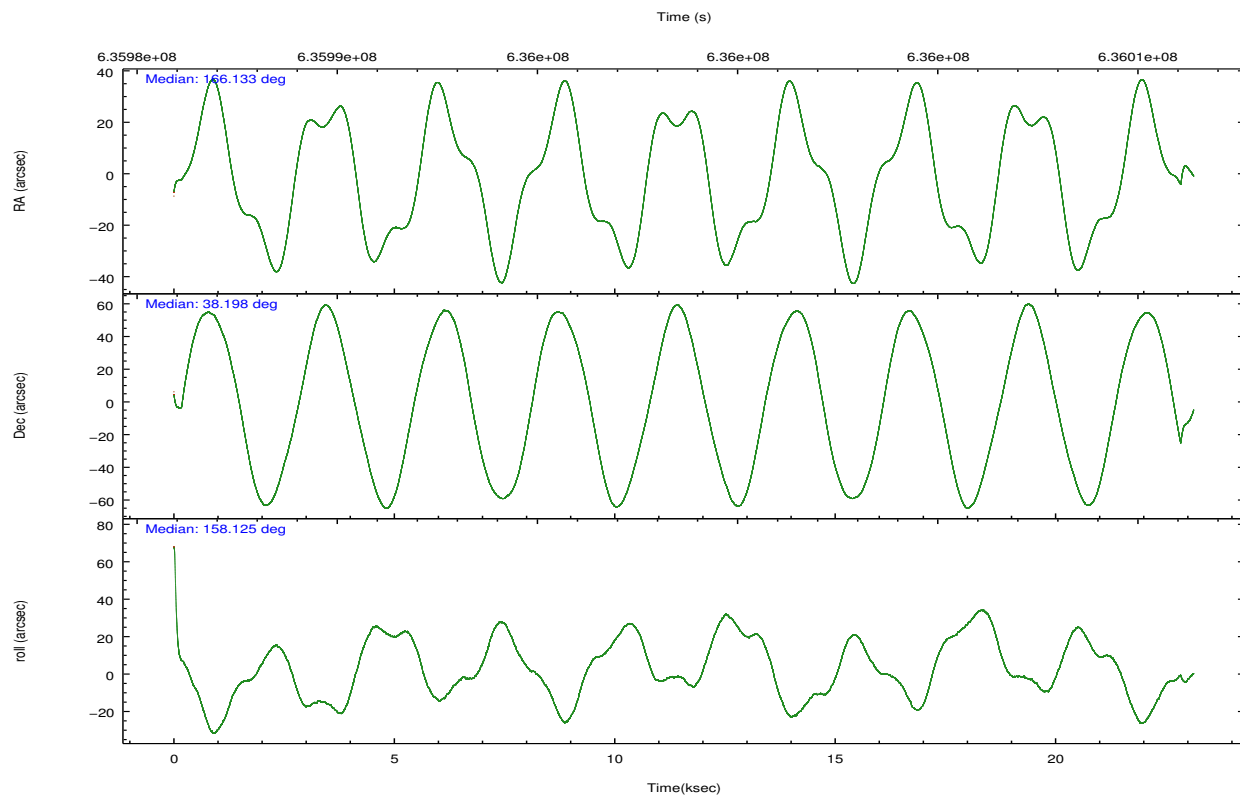
2.2 Compared Parameters

Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-56789	ACIS-56789
Grating	LETG	LETG
Data mode	FAINT	FAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	166.166394	166.132165066919
[deg] Pointing Dec	38.201559	38.19786597852767
[deg] Pointing Roll	157.967186	158.1450130298938
[s] Window start time (MET)	635040069.184000	635040069.184000
[s] Window stop time (MET)	637459269.184000	637459269.184000
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-181.282523	-181.2947048189838
[mm] SIM translation stage offset	-8.85	-8.83781776402401
[s] Observation start time (MET)	635987231.184000	635986014.9116499
Observation start date	2018-02-25T23:06:02	2018-02-25T22:46:54
[s] Observation end time (MET)	636010231.184000	636010746.62561
Observation end date	2018-02-26T05:29:22	2018-02-26T05:39:06
Read mode	TIMED	TIMED

Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
CCD I0 on	N	N
CCD I1 on	N	N
CCD I2 on	N	N
CCD I3 on	N	N
CCD S0 on	N	N
CCD S1 on	Y	Y
CCD S2 on	Y	Y
CCD S3 on	Y	Y
CCD S4 on	Y	Y
CCD S5 on	O1	Y
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	CUSTOM	CUSTOM
Subarray start row	1	1
Subarray row count	300	300
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	1.1

2.3 Aspect



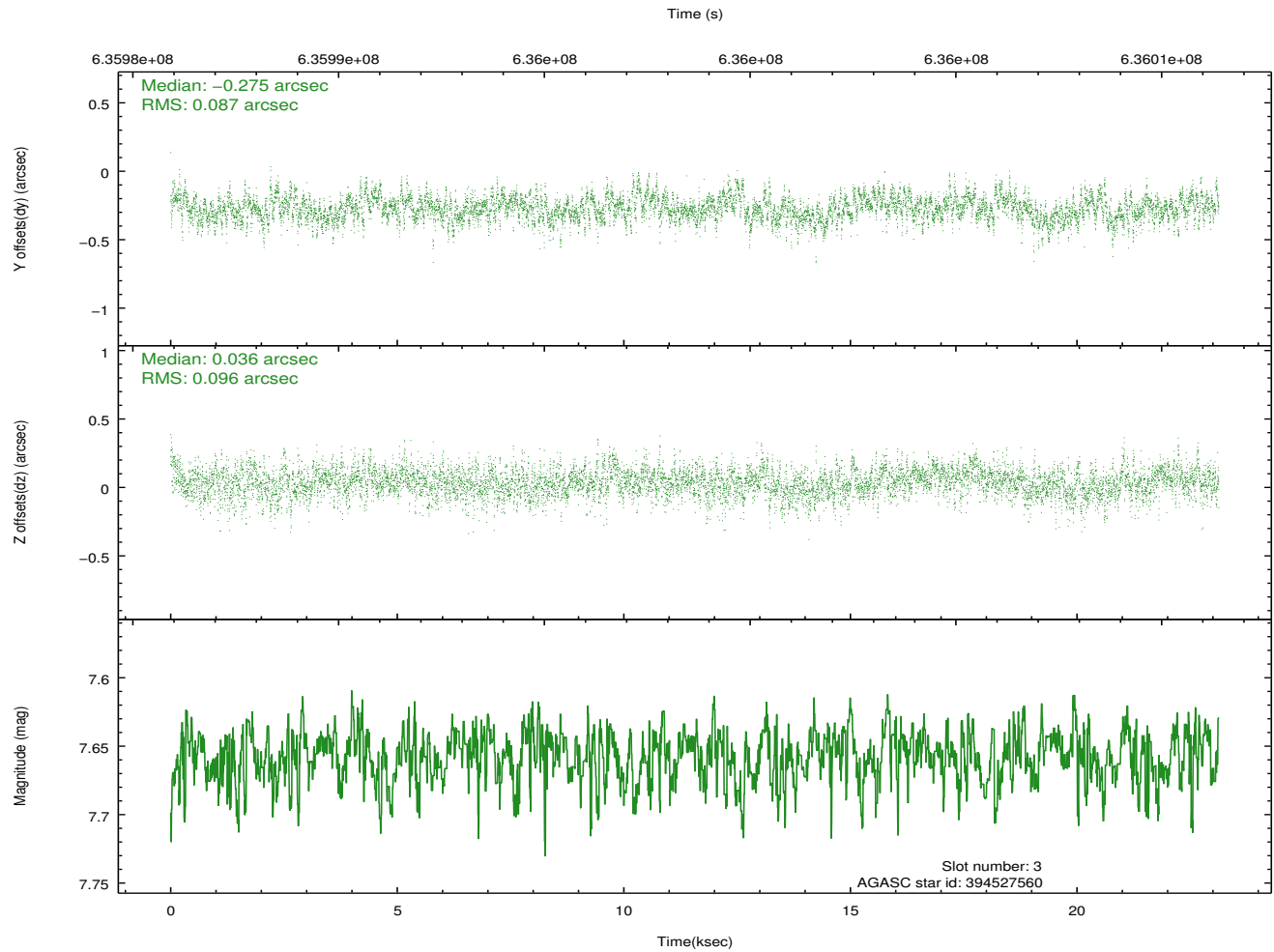
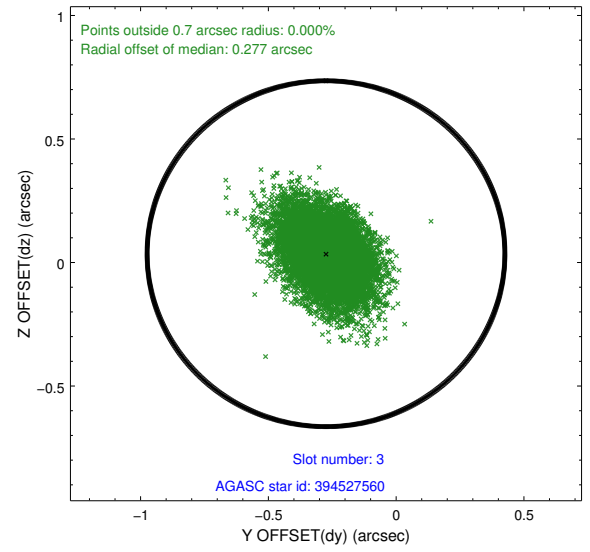
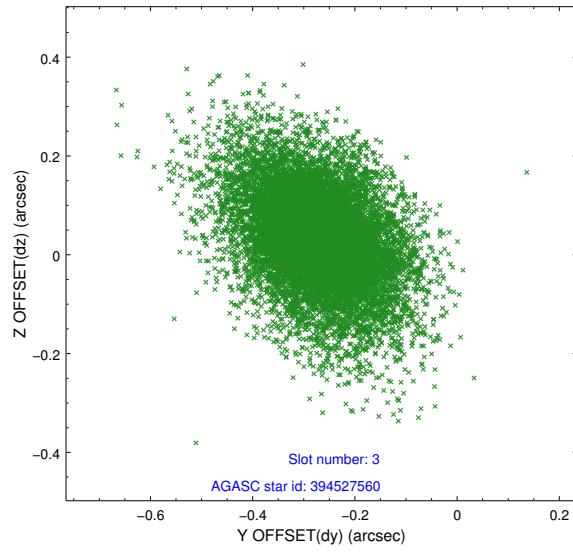


Slot Statistics

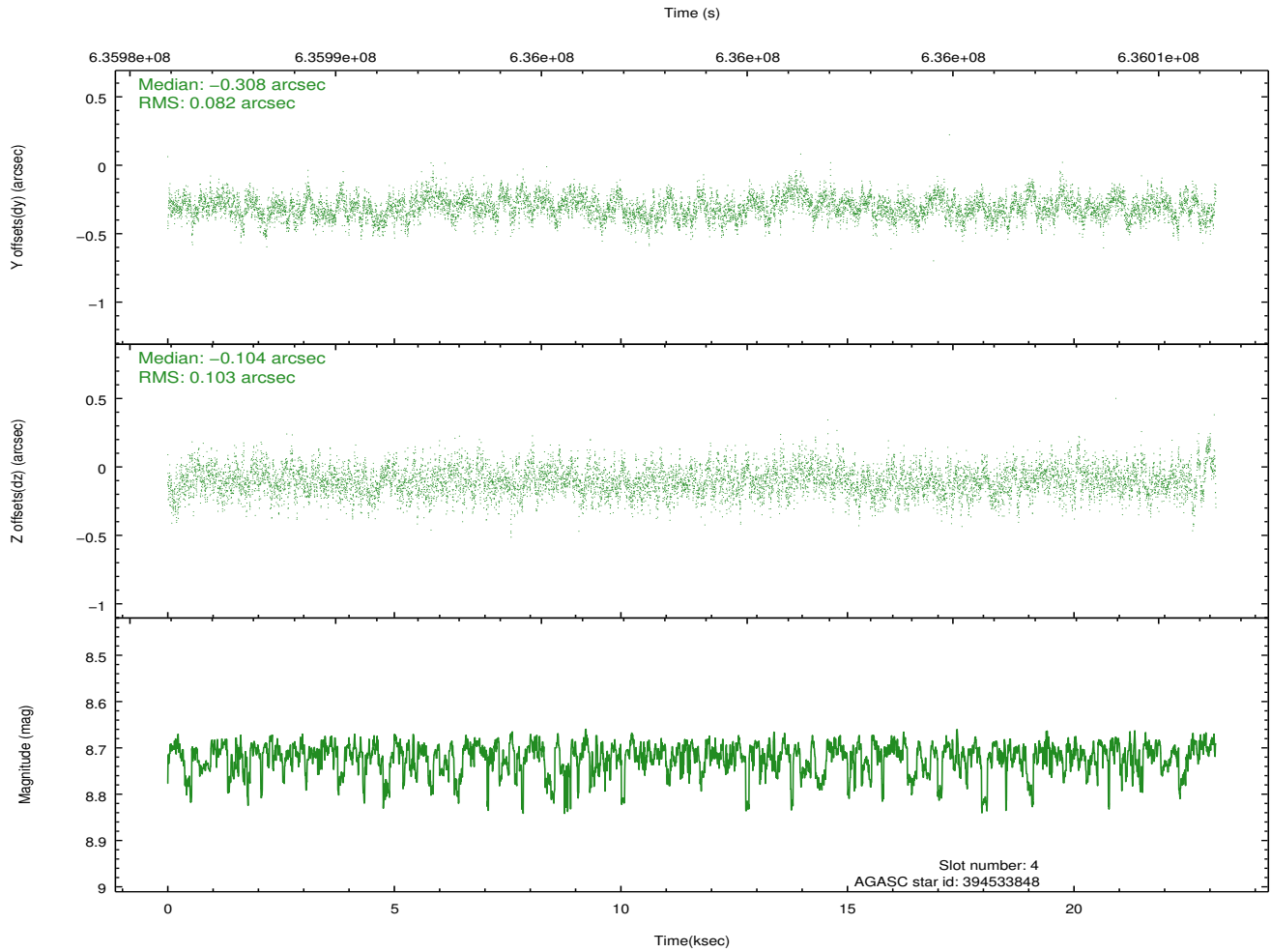
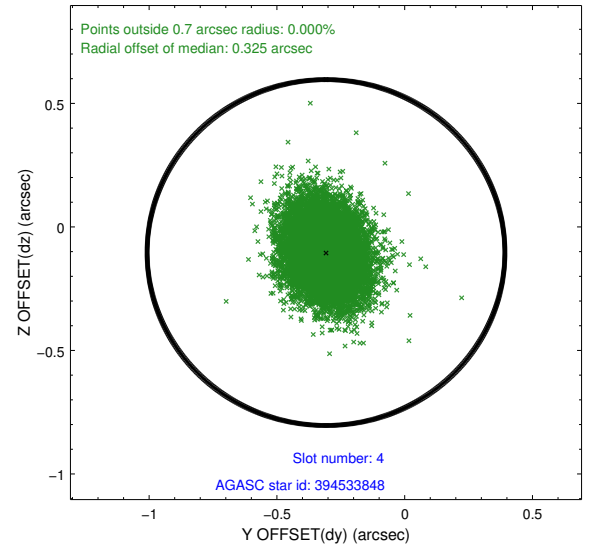
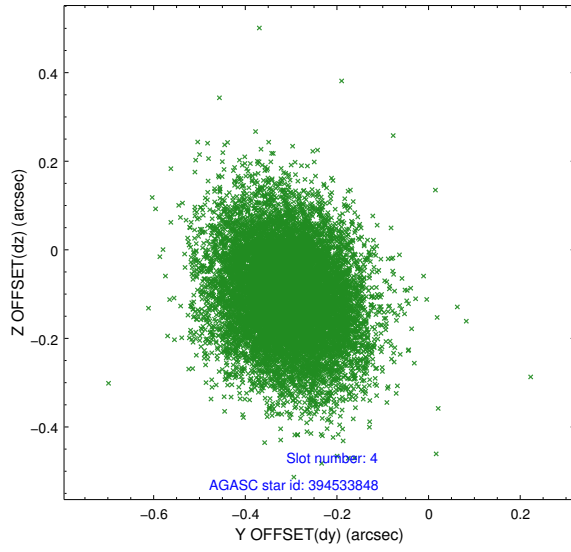
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-S-1	7.10	5643	0.194	0.249	0.019	0.028	0.000000	0.000000	921.28	-1922.09
1	FID		ACIS-S-2	6.99	5642	-0.371	-0.251	0.022	0.033	0.000000	0.000000	-775.11	-1927.31
2	FID		ACIS-S-6	7.30	5643	0.159	0.002	0.016	0.023	0.000000	0.000000	386.83	618.81
3	GUIDE	used	394527560	7.66	11282	-0.275	0.036	0.133	0.233	165.970713	38.960939	1534.17	-2326.18
4	GUIDE	used	394533848	8.72	11275	-0.308	-0.104	0.139	0.230	166.382906	38.276007	-460.27	-475.41
5	GUIDE	used	394546712	6.59	11283	-0.364	-0.244	0.125	0.211	166.451462	38.394357	-483.61	-943.44
6	GUIDE	used	394546720	6.43	11285	0.618	0.202	0.150	0.249	166.130115	38.241361	149.51	-91.73
7	GUIDE	used	394530152	7.49	11284	0.330	0.115	0.131	0.220	166.075805	38.868252	1136.95	-2126.74

2.4 Star Slots

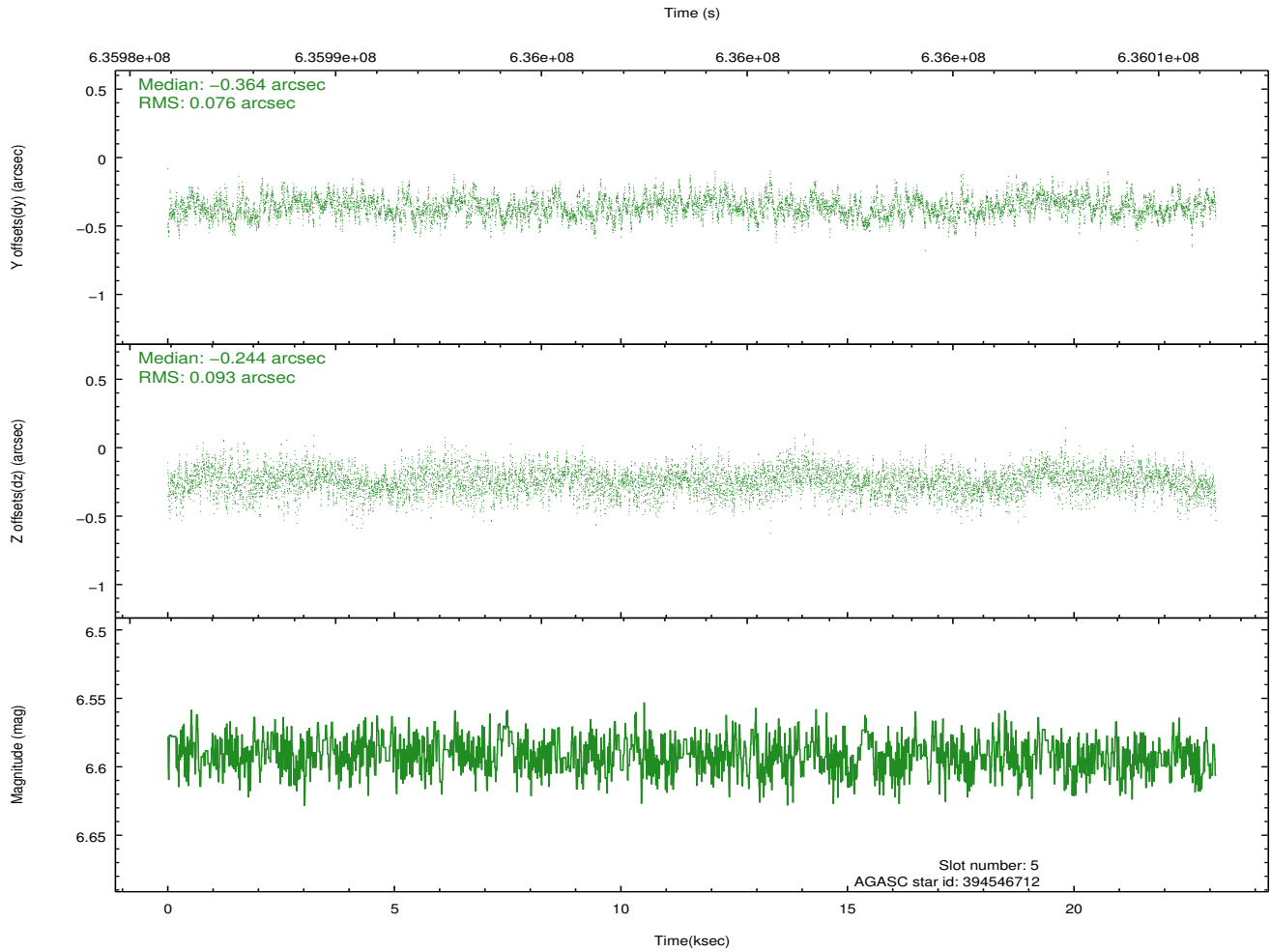
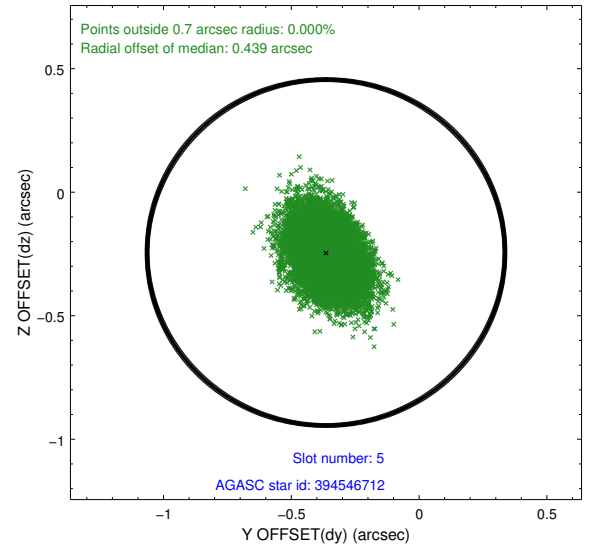
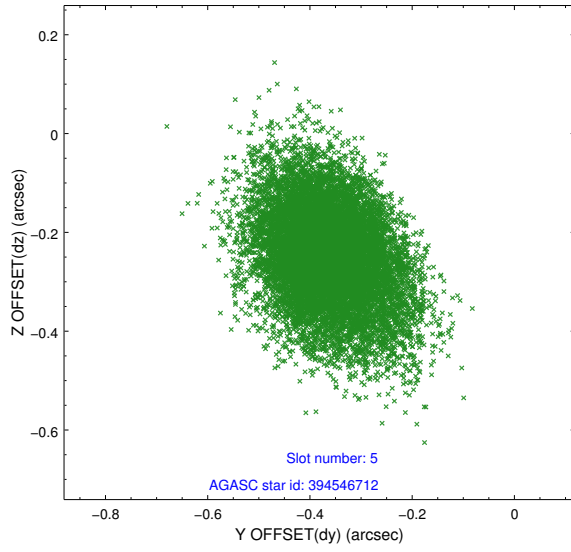
2.4.1 Slot 3



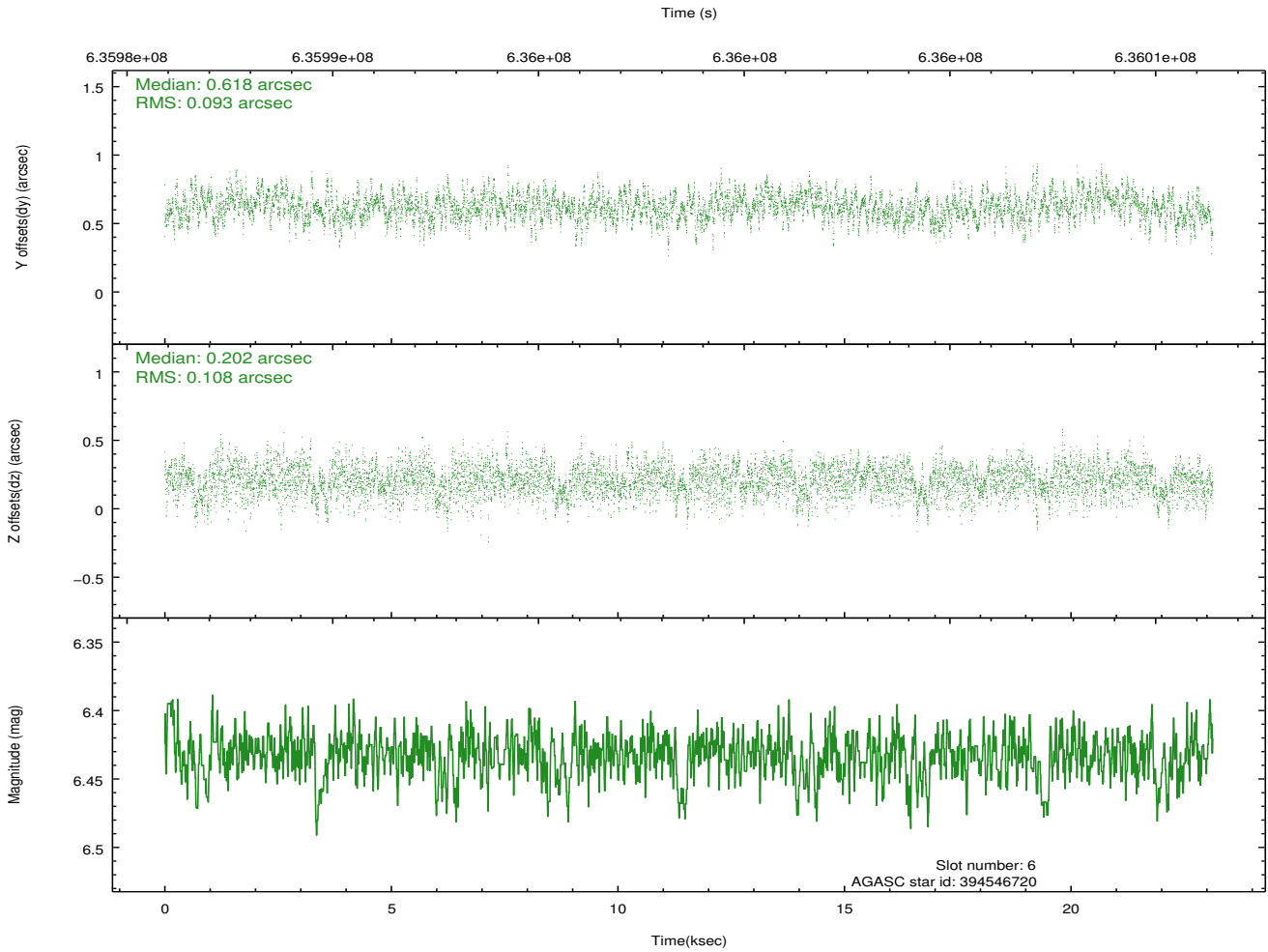
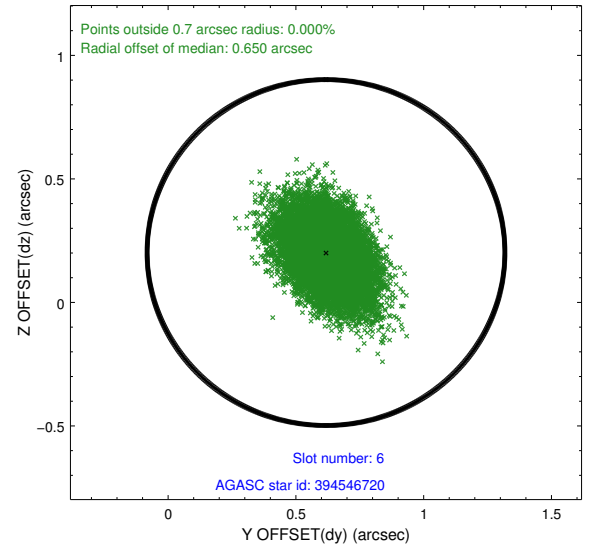
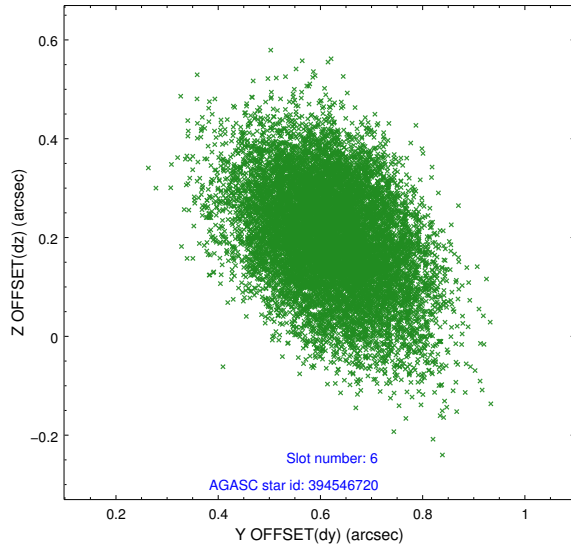
2.4.2 Slot 4



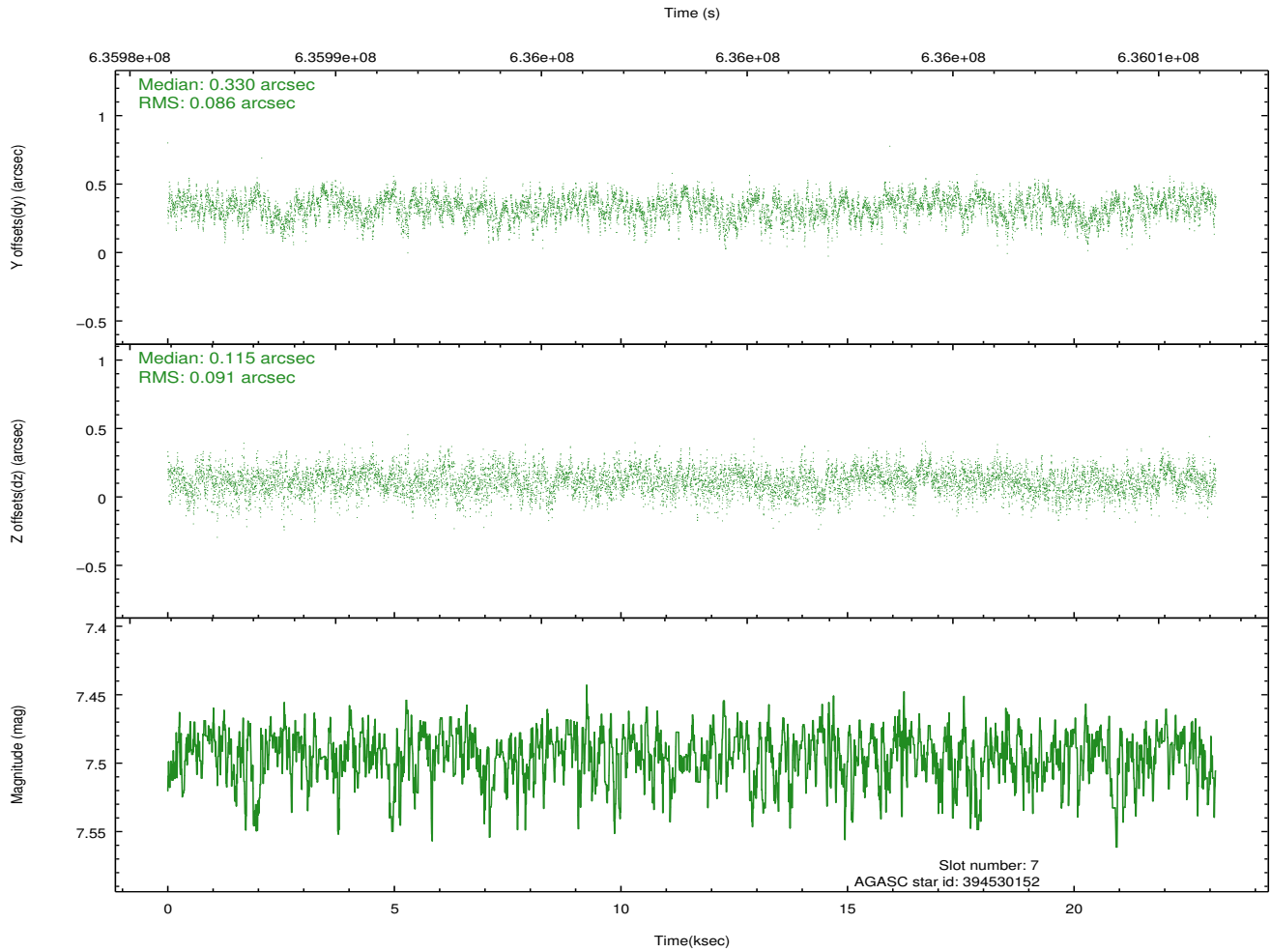
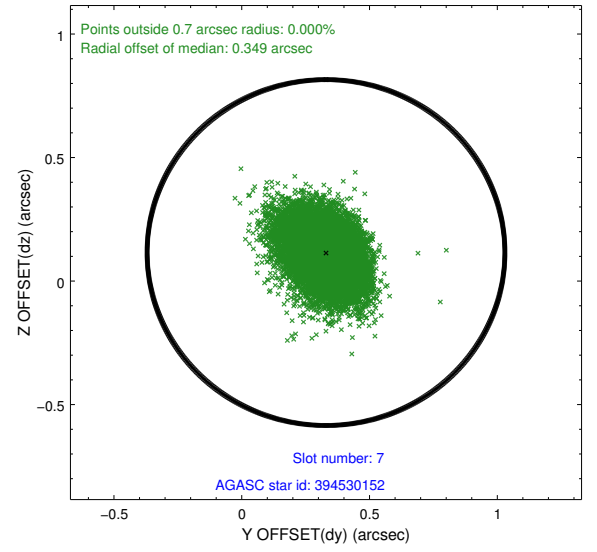
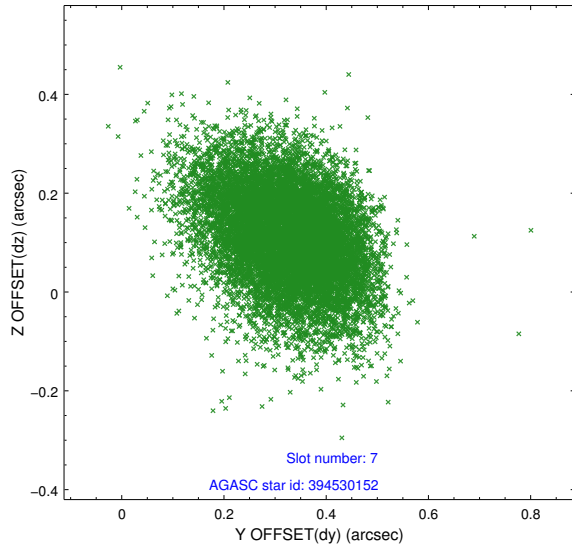
2.4.3 Slot 5



2.4.4 Slot 6

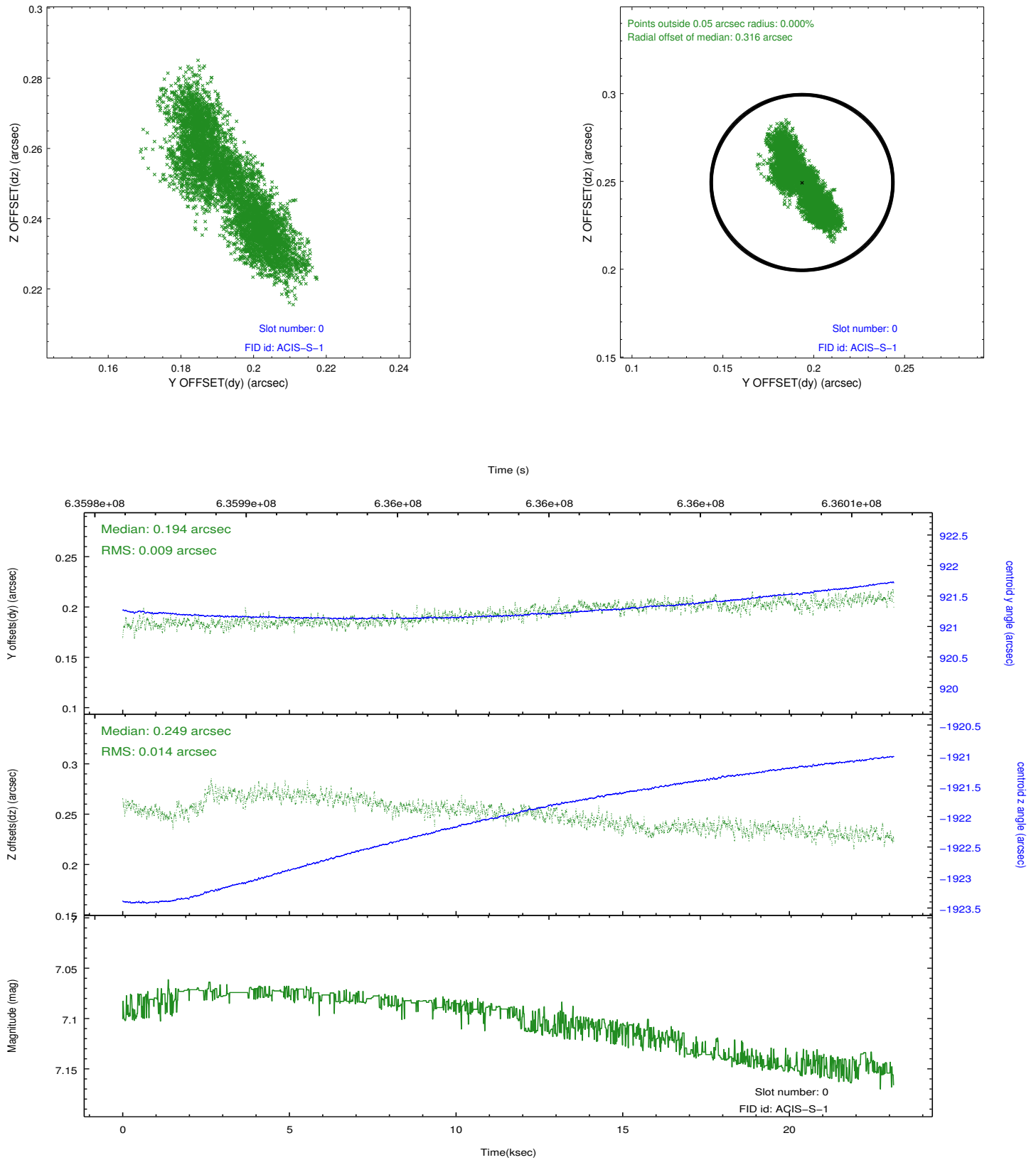


2.4.5 Slot 7

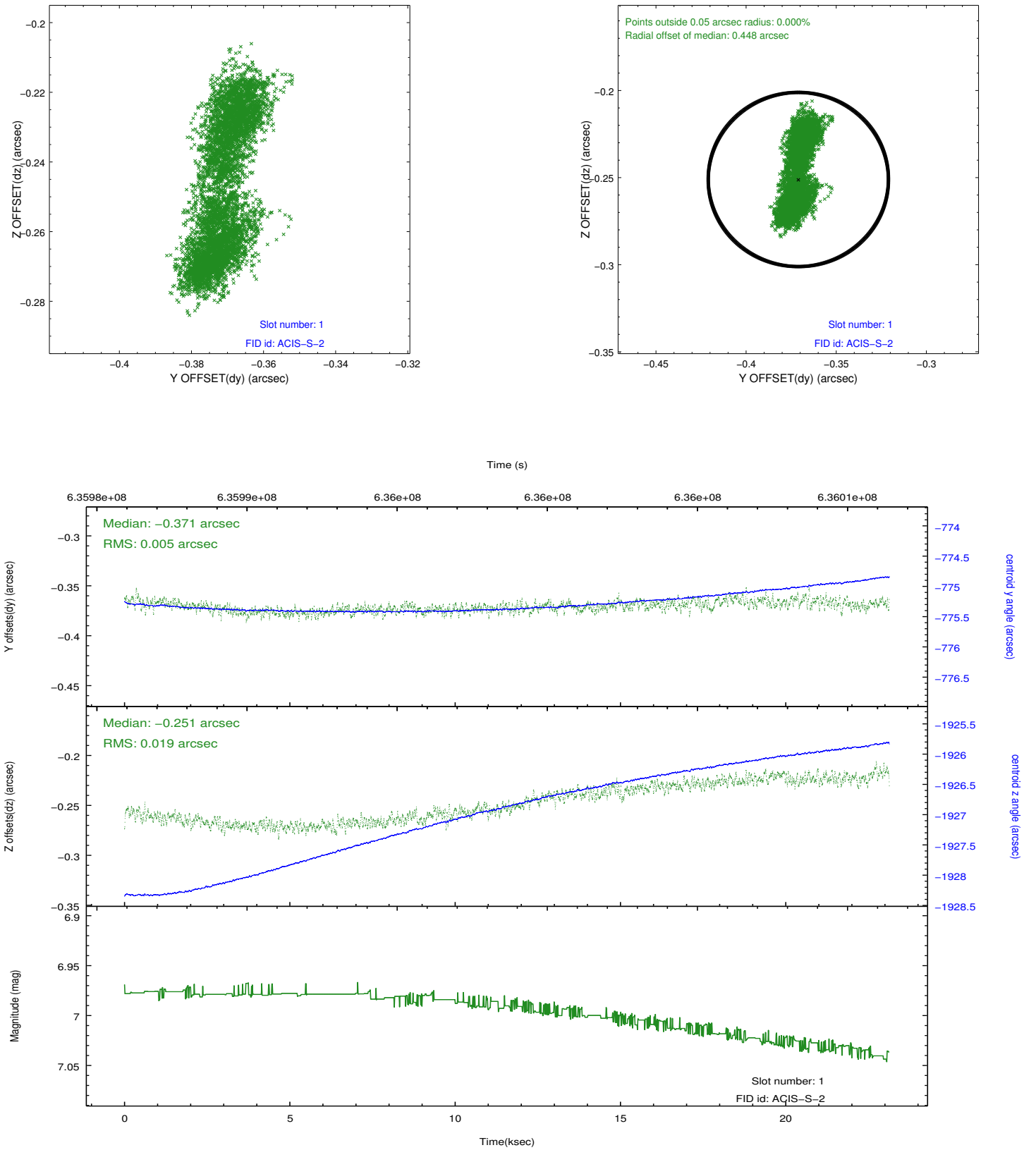


2.5 FID Slots

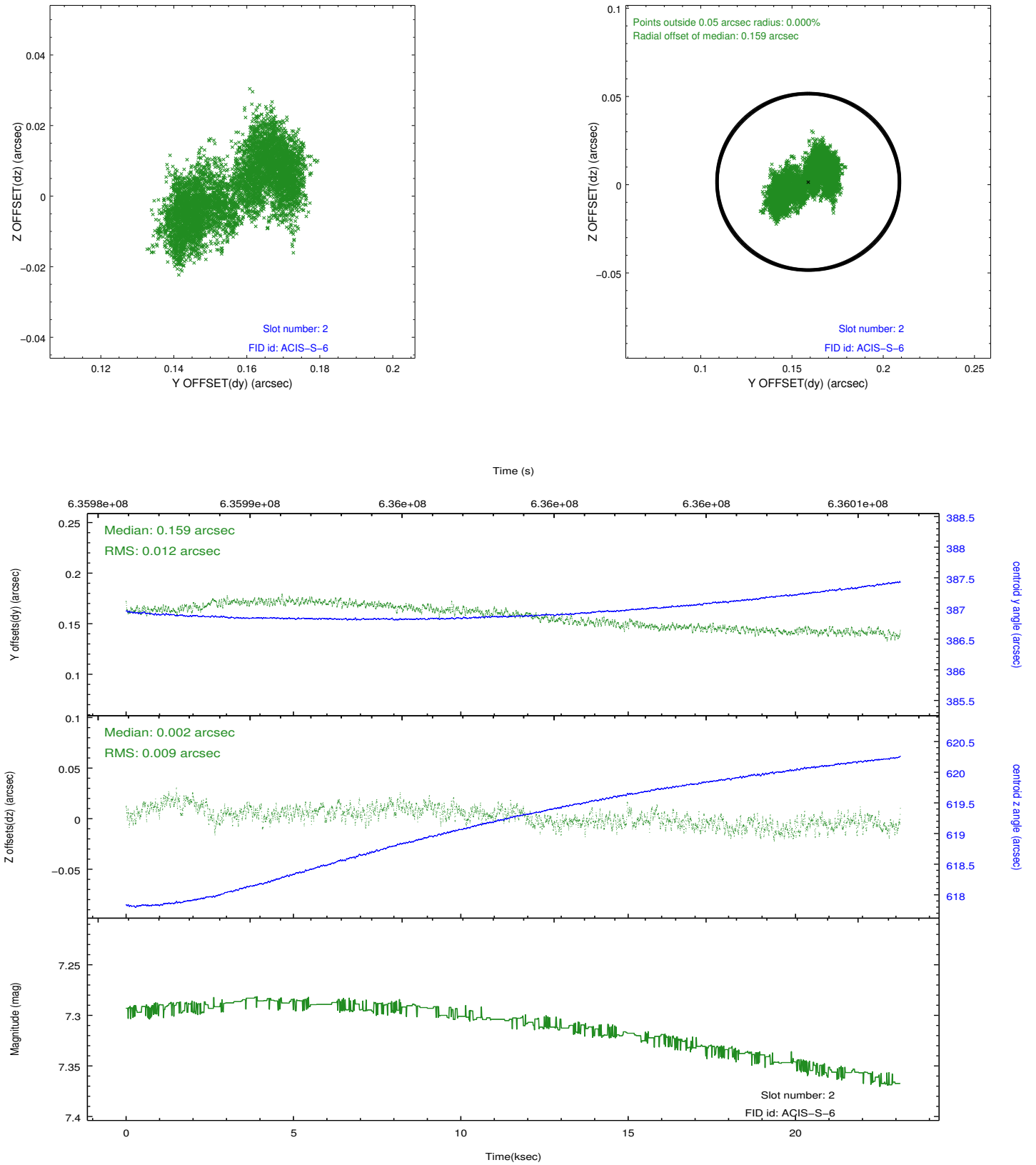
2.5.1 Slot 0



2.5.2 Slot 1

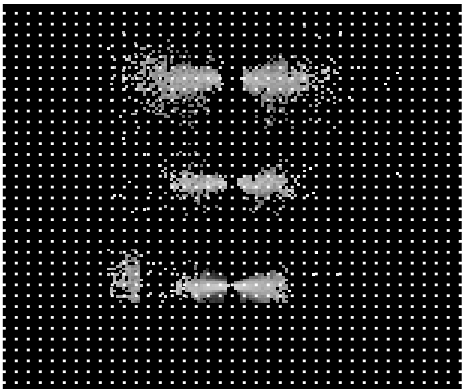


2.5.3 Slot 2

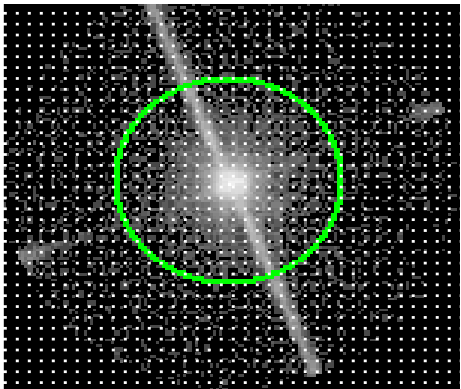


3 Gratings

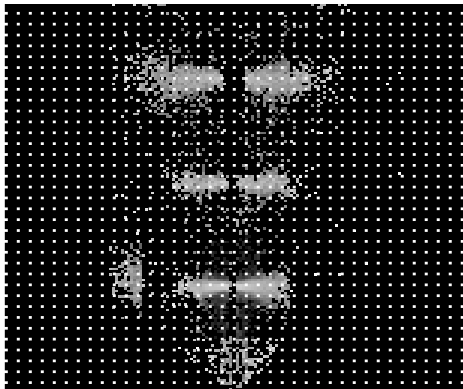
3.1 LETG Arm



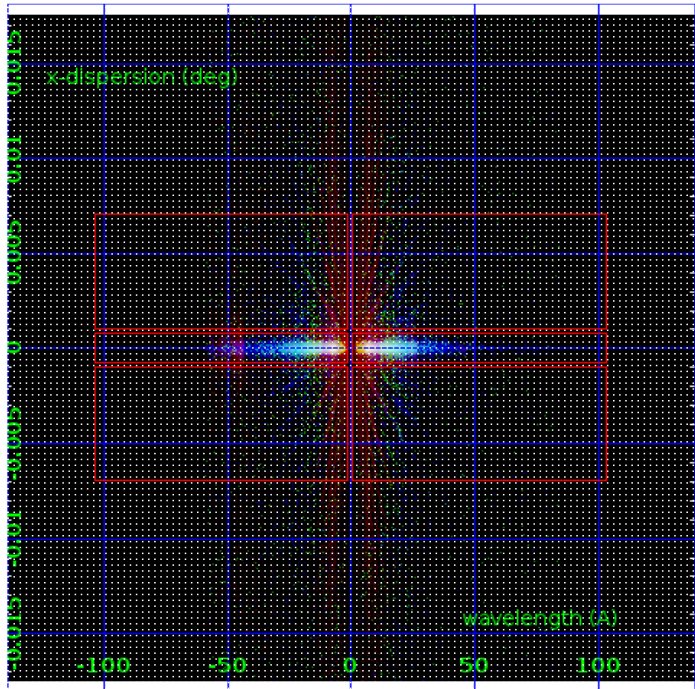
LETG Order Sort 123



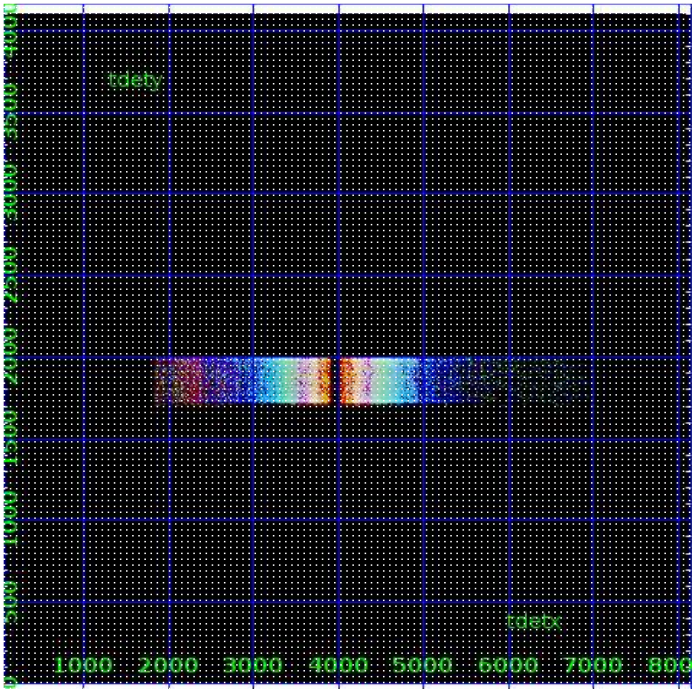
LETG Zero Order



LETG Order Sort ALL

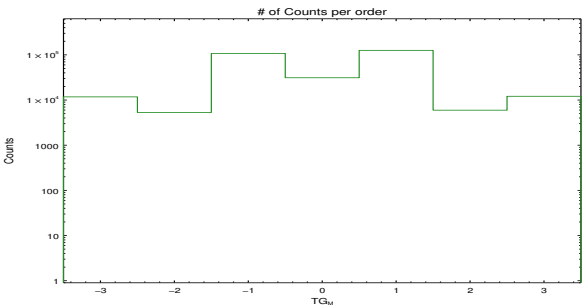


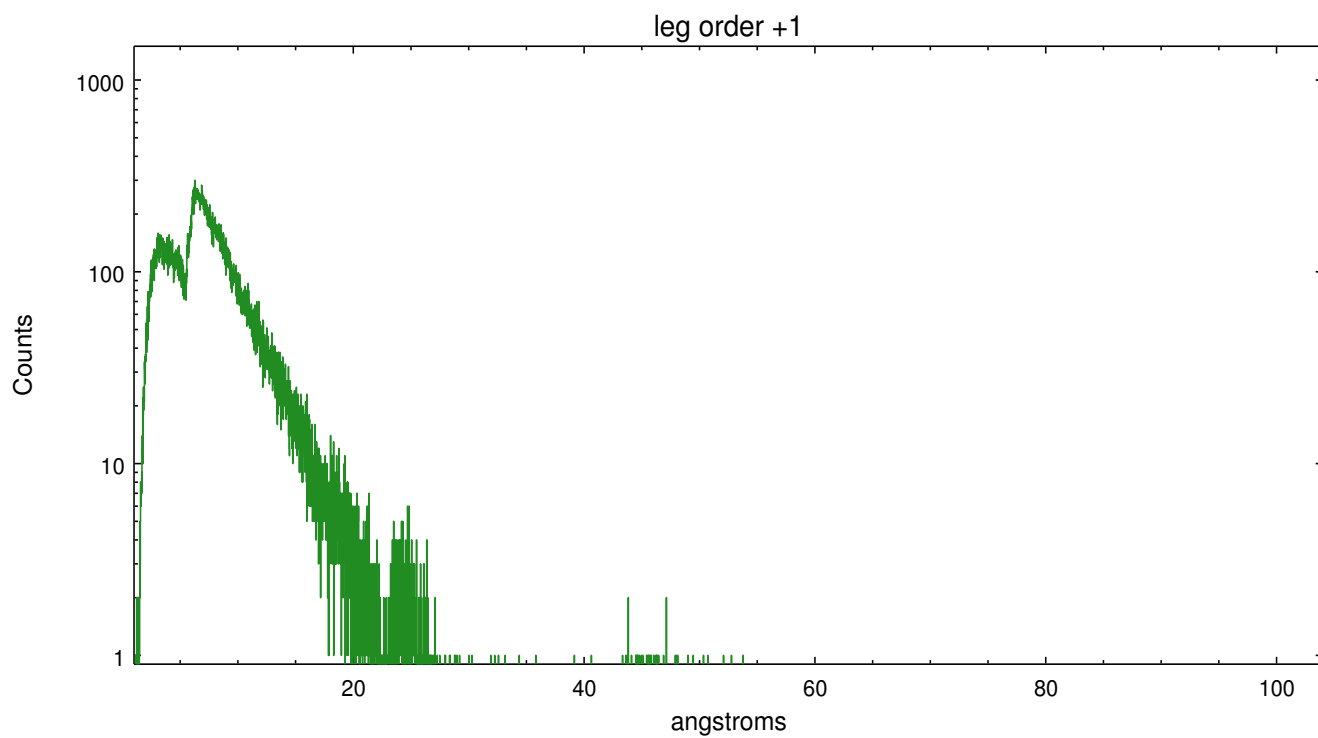
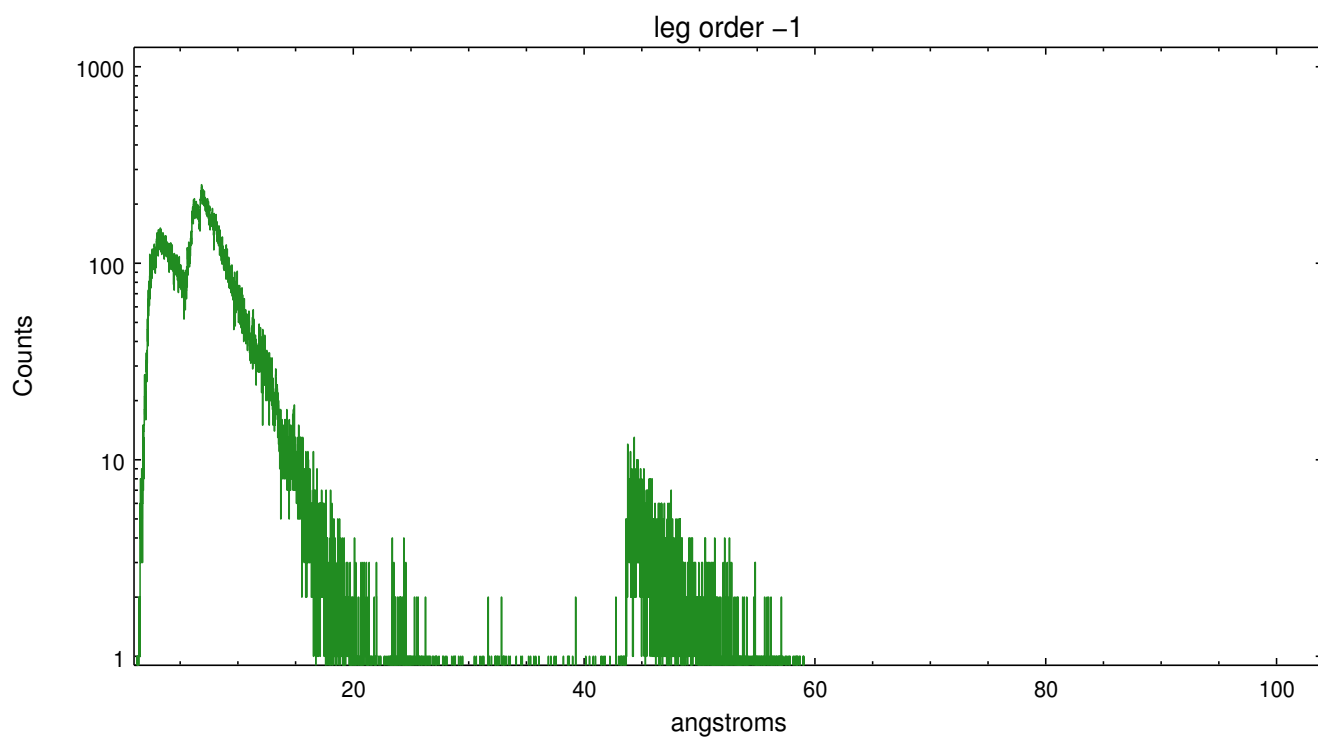
Spot Image LETG



Full Detector LETG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	11757	5310	107707	31164	125837	5961	12100





A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2018.02.26
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	23.076900500298

A.2 Comments

Big dither pattern used. z amplitude approximately 9 times y amplitude, with modified frequency. See archive metadata for details.

===

Zeroth order is extended and 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.

====

WARNING: Zeroth order selected by pipeline tools is well-centered in the extended source but is not at the position(s) of brightest emission. The user may want to select a region or source of interest, then use software tools such as CIAO to specify the coordinates of the zeroth order source of interest before running the tools to resolve the dispersed events.

===

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.