

V&V Reference Report

L2 ASCDS Version : 10.6

Observation 20720 - L2 Version 1
Chandra X-Ray Center

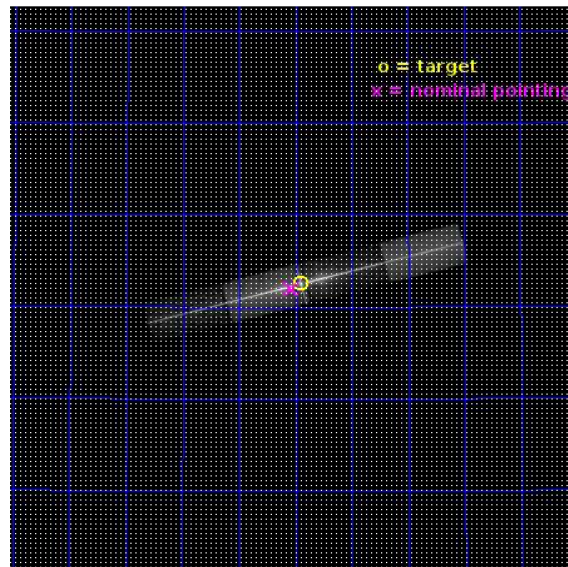
L2 Processing Date : Feb 27 2018

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1 Front

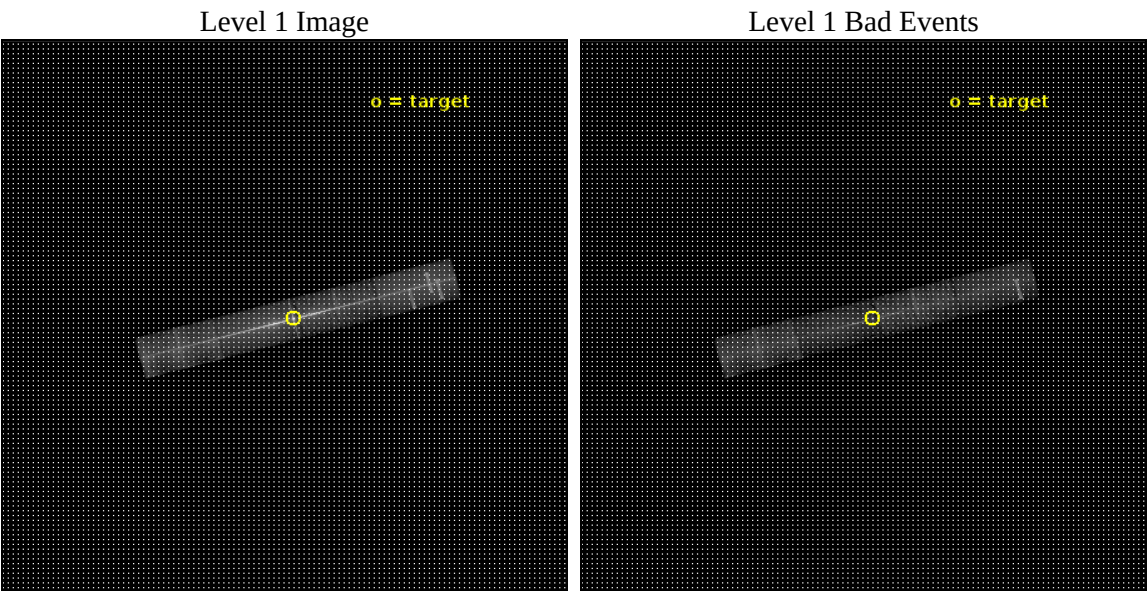
seq_num	790318	Sequence number
obs_id	20720	Observation id
title	AO-19 Big Dither Observation of Mkn421	Proposal title
observer	CXC Calibration	Principal investigator
object	MKN421	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	166.113333	Observer's specified target RA [deg]
dec_targ	38.208806	Observer's specified target Dec [deg]
ra_nom	166.13408469203	Nominal RA [deg]
dec_nom	38.199688640265	Nominal Dec [deg]
roll_nom	165.14377923602	Nominal Roll [deg]
revision	1	Processing version of data
ontime	27927.470623732	Sum of GTIs [s]
livetime	26922.998042229	Livetime [s]
ontime5	27927.429583788	Sum of GTIs [s]
ontime6	27927.388543725	Sum of GTIs [s]
ontime7	27927.470623732	Sum of GTIs [s]
ontime8	27927.347503781	Sum of GTIs [s]
l2events	507728	Number of level 2 events



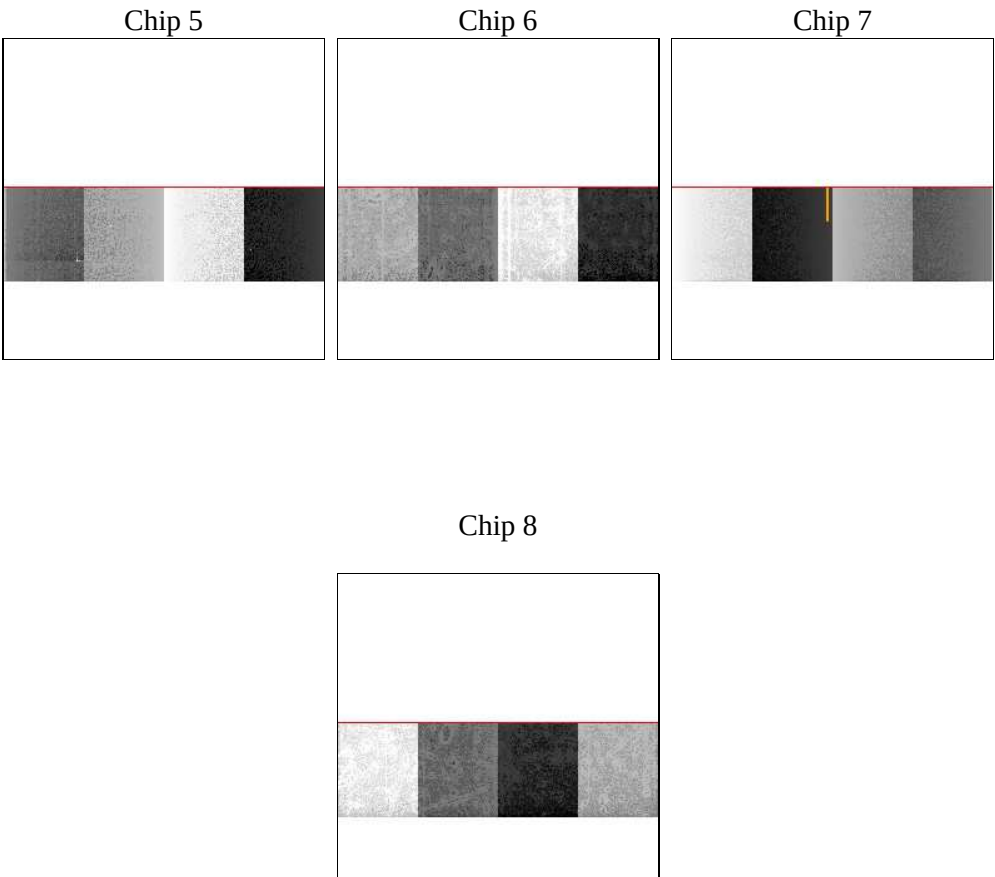
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	27838.612000	[s] Scheduled observation exposure time
ascdsver	10.6	Processing system revision	ontime	27927.470623732	Sum of GTIs [s]
caldsver	4.7.7	 	ontime5	27927.429583788	Sum of GTIs [s]
date	2018-02-27T05:29:21	Date and time of file creation	ontime6	27927.388543725	Sum of GTIs [s]
revision	1	Processing version of data	ontime7	27927.470623732	Sum of GTIs [s]
			ontime8	27927.347503781	Sum of GTIs [s]
			l1events	838303	Number of level 1 events
			tgmethod	FINDZO	Method used to create src1a file
			zo_pos	(4211.66, 4164.03)	src1a sky pixel position
			zo_pos_tgd	(4212.25, 4163.75)	src1a sky pixel position via radetect

2.1.4 Events

	ccd 5	ccd 6	ccd 7	ccd 8
level 1 events	160517	224395	348602	104789
rejected events	60765	63884	72817	71002
rejected %	37%	28%	20%	67%

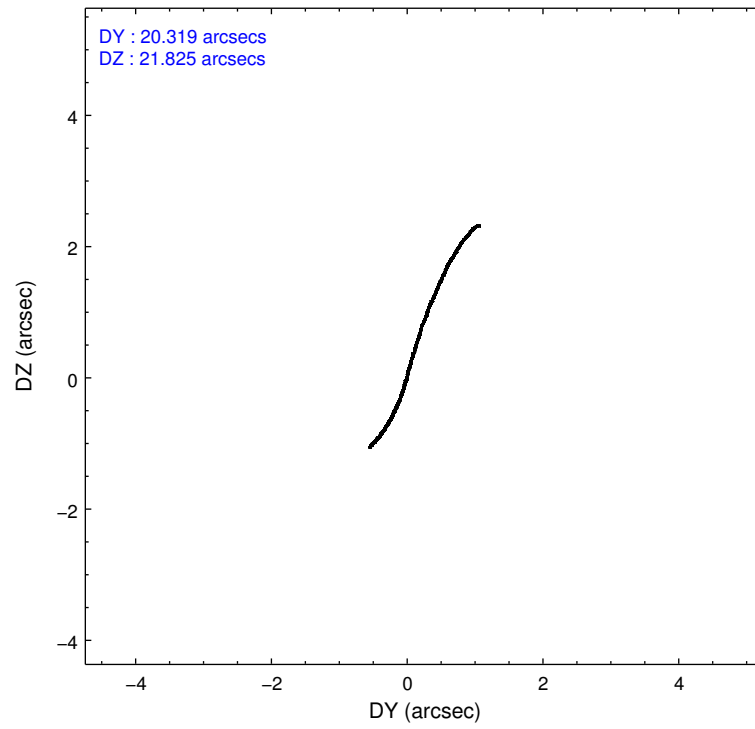
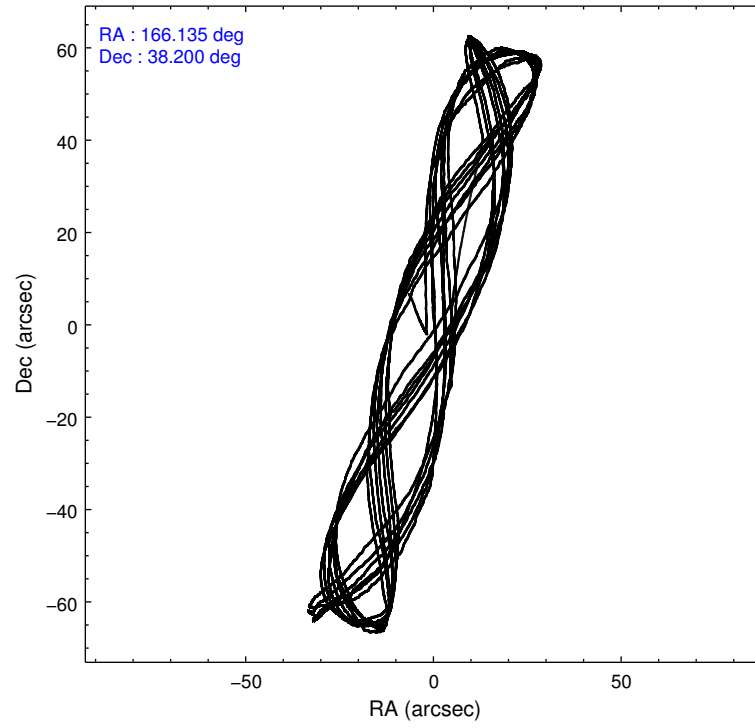
	ccd 5	ccd 6	ccd 7	ccd 8
grade 0 events	44291	124377	68970	15346
	27%	55%	19%	14%
grade 1 events	237	890	1656	62
	0%	0%	0%	0%
grade 2 events	20163	18343	68264	6199
	12%	8%	19%	5%
grade 3 events	5360	6092	30608	2726
	3%	2%	8%	2%
grade 4 events	3274	6048	30077	2497
	2%	2%	8%	2%
grade 5 events	14076	3446	14588	4275
	8%	1%	4%	4%
grade 6 events	26674	5665	77890	7022
	16%	2%	22%	6%
grade 7 events	46442	59534	56549	66662
	28%	26%	16%	63%

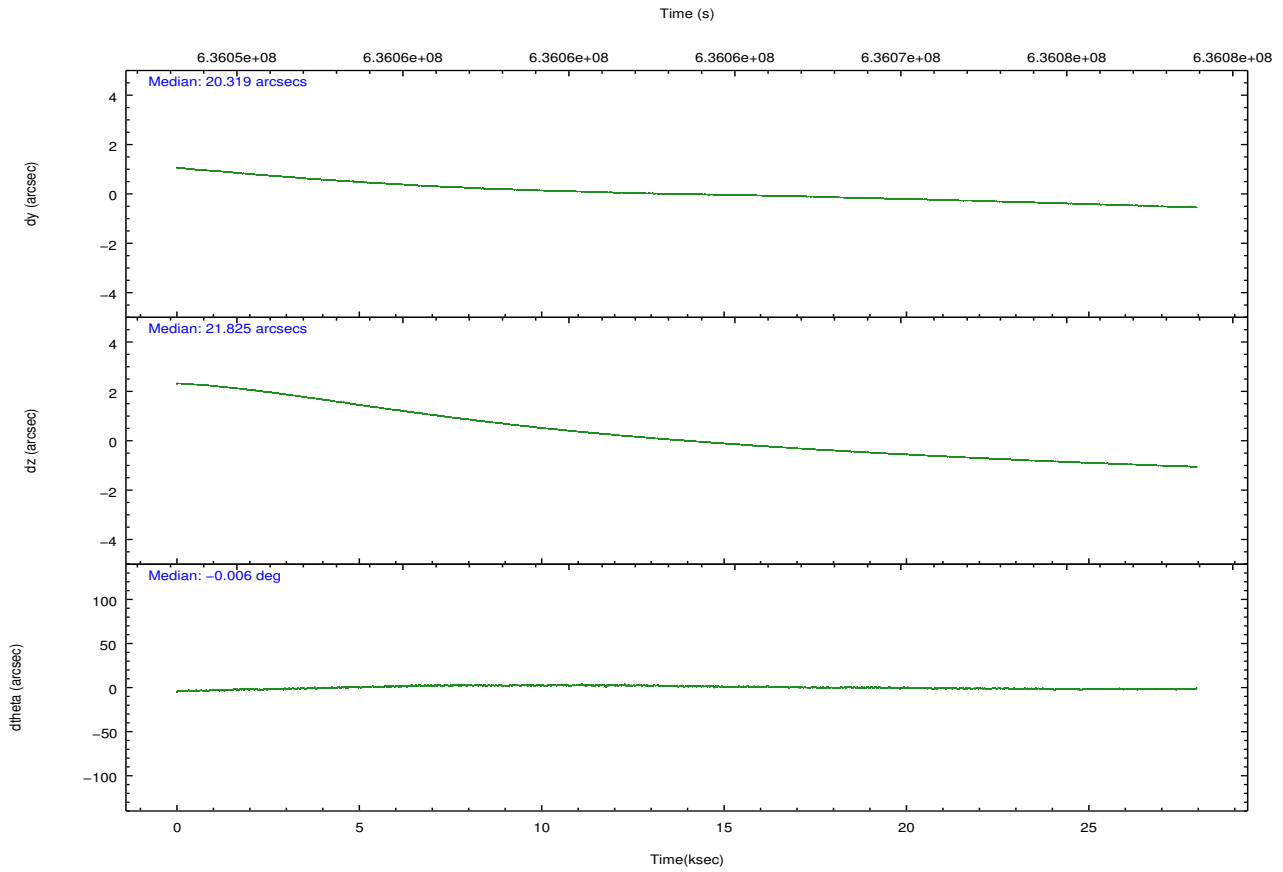
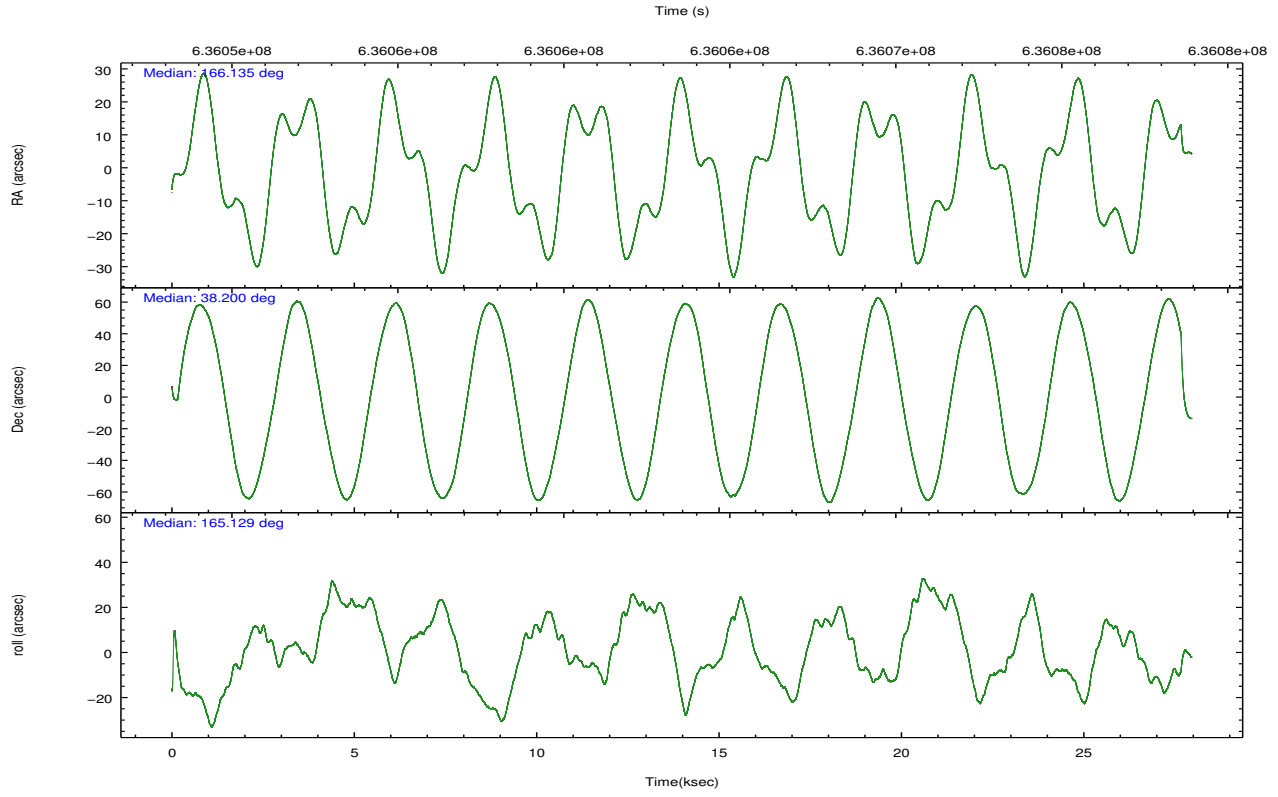
2.2 Compared Parameters

Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-5678	ACIS-5678
Grating	LETG	LETG
Data mode	FAINT	FAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	166.167544	166.134084692034
[deg] Pointing Dec	38.206759	38.19968864026481
[deg] Pointing Roll	164.966479	165.1437792360165
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-187.252523	-187.2460891377763
[mm] SIM translation stage offset	-2.88	-2.886433445231489
[s] Observation start time (MET)	636049699.184000	636048415.89033
Observation start date	2018-02-26T16:27:10	2018-02-26T16:06:55
[s] Observation end time (MET)	636077537.184000	636078032.75457
Observation end date	2018-02-27T00:11:08	2018-02-27T00:20:32
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	N
Number of optional ACIS chips dropped	1	1
On-chip summing requested	N	N
Subarray requested	CUSTOM	CUSTOM
Subarray start row	251	251
Subarray row count	300	300
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	1.1

2.3 Aspect



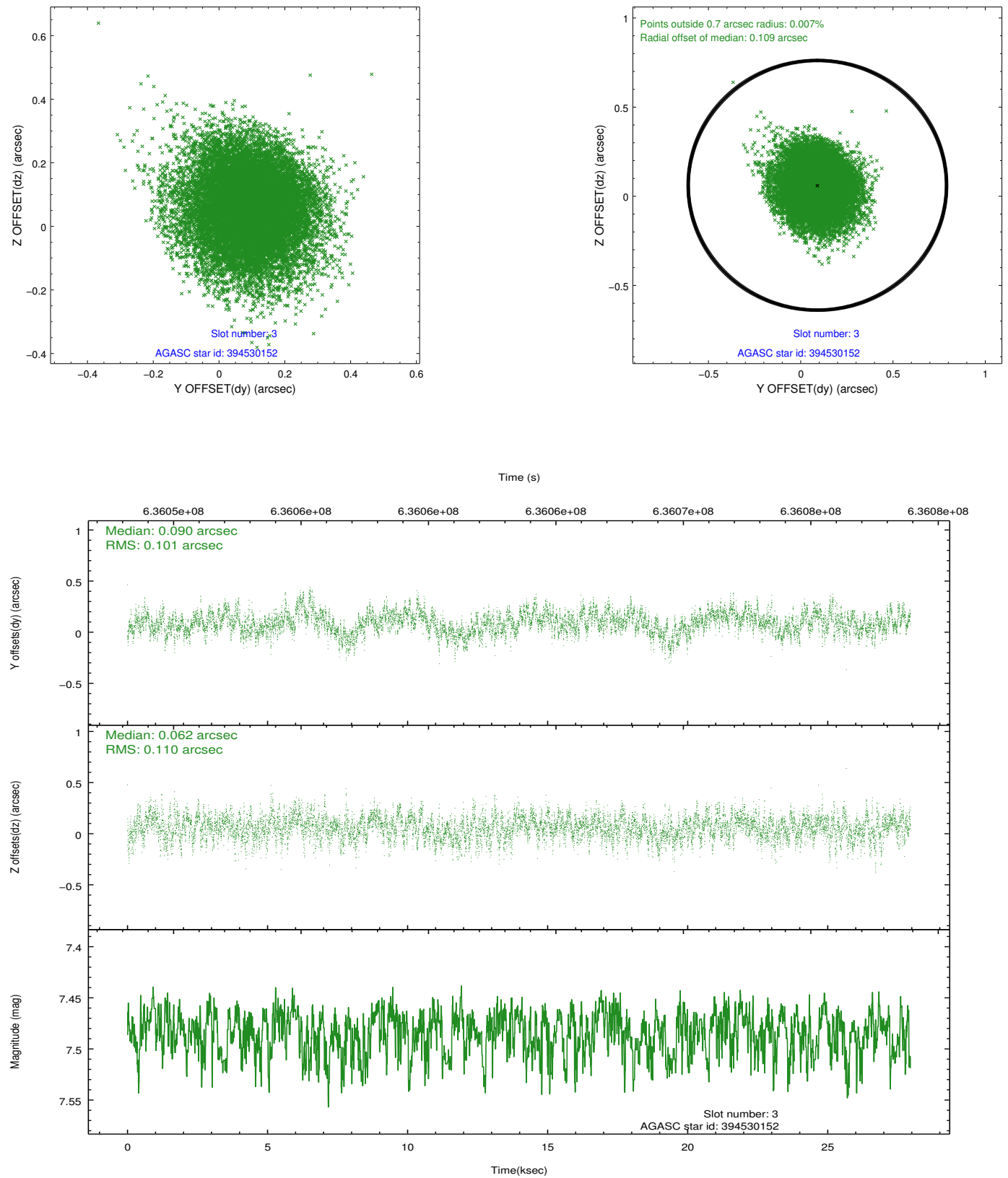


Slot Statistics

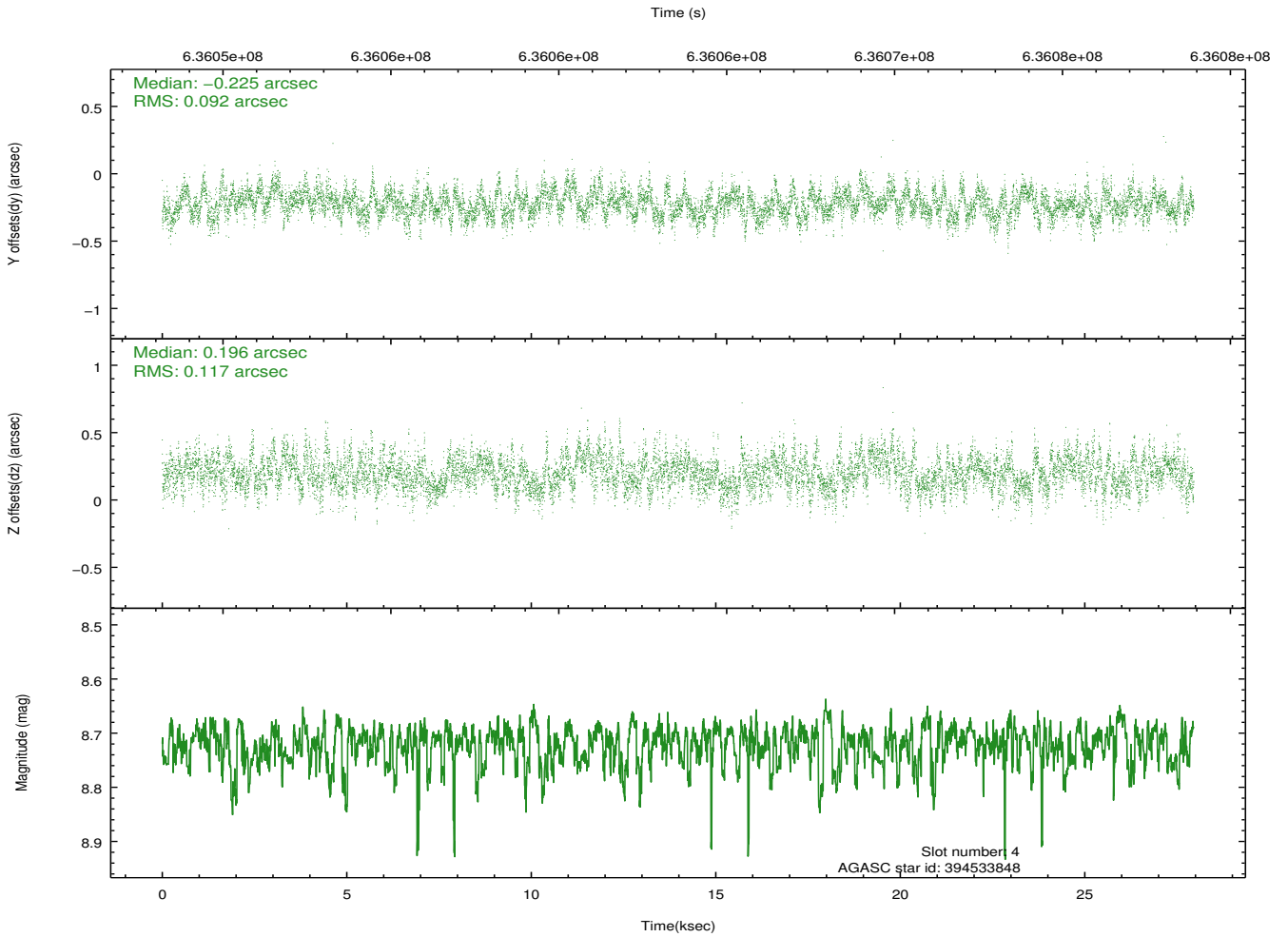
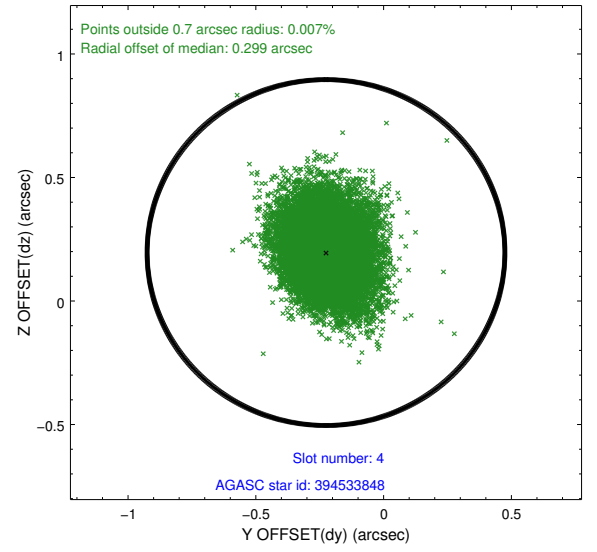
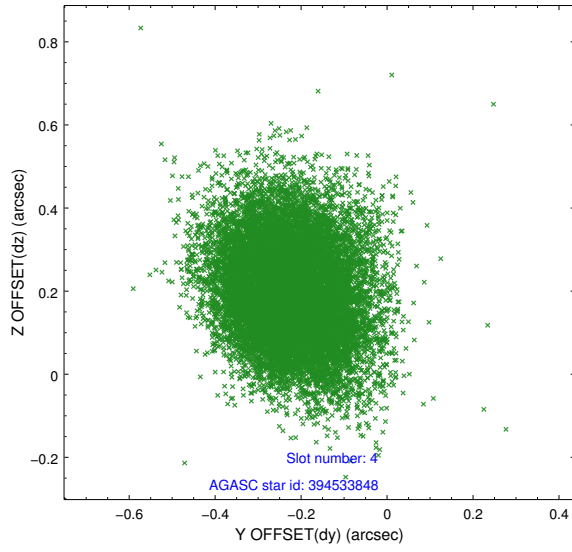
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-S-2	7.09	6817	-0.309	-0.104	0.025	0.041	0.000000	0.000000	-773.55	-1803.39
1	FID		ACIS-S-4	7.20	6819	0.612	0.177	0.016	0.029	0.000000	0.000000	2140.54	105.37
2	FID		ACIS-S-5	7.20	6819	-0.339	-0.065	0.024	0.036	0.000000	0.000000	-1826.37	98.77
3	GUIDE	used	394530152	7.48	13634	0.090	0.062	0.158	0.258	166.075805	38.868252	866.97	-2231.06
4	GUIDE	used	394533848	8.72	13630	-0.225	0.196	0.157	0.257	166.382906	38.276007	-516.63	-396.92
5	GUIDE	used	394543960	9.73	13581	-0.294	-0.545	0.300	0.491	165.802757	37.787371	610.71	1726.79
6	GUIDE	used	394546712	6.59	13638	-0.373	0.057	0.152	0.253	166.451462	38.394357	-596.82	-858.55
7	GUIDE	used	394546720	6.43	13635	0.810	0.234	0.171	0.283	166.130115	38.241361	135.53	-90.71

2.4 Star Slots

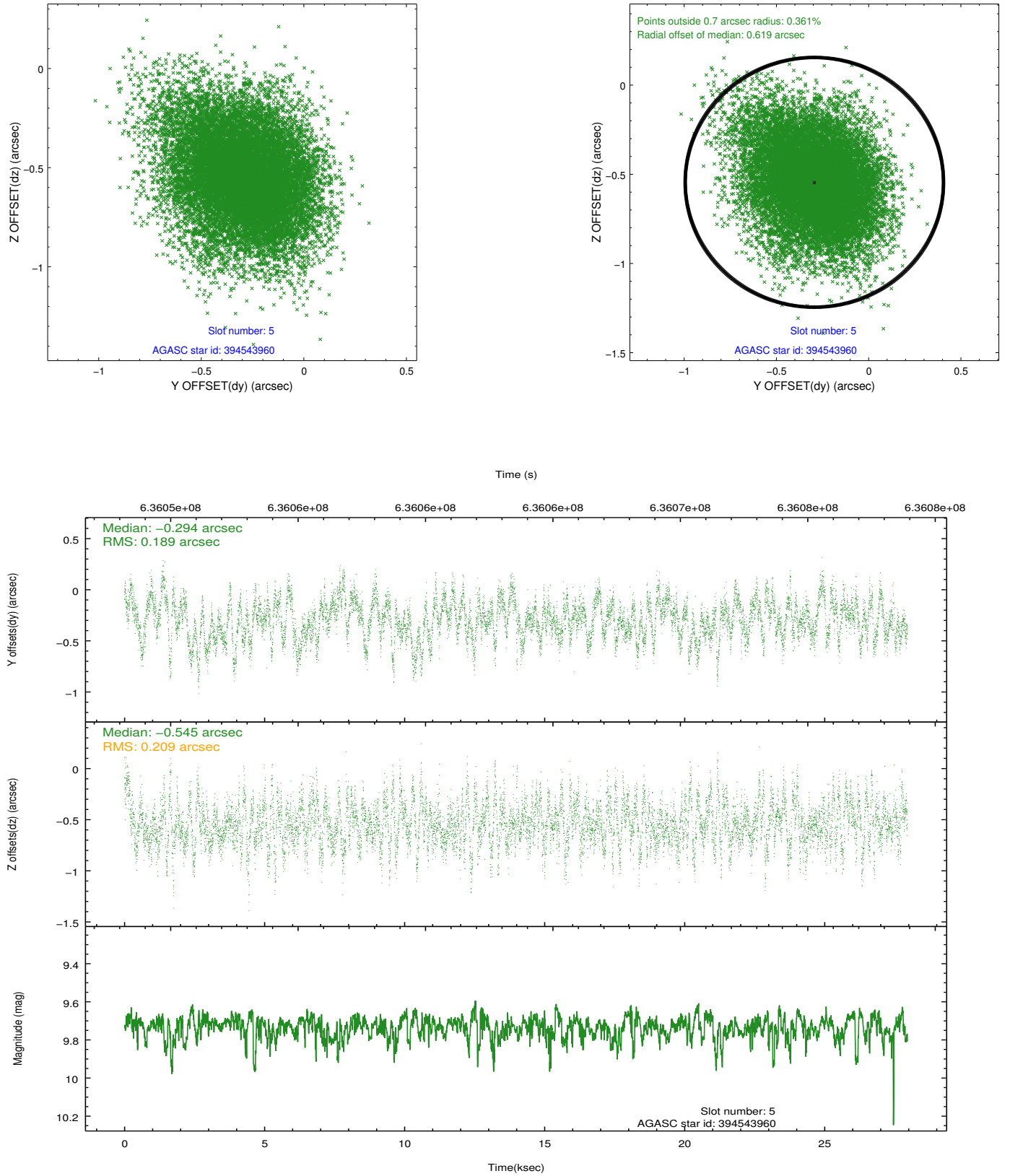
2.4.1 Slot 3



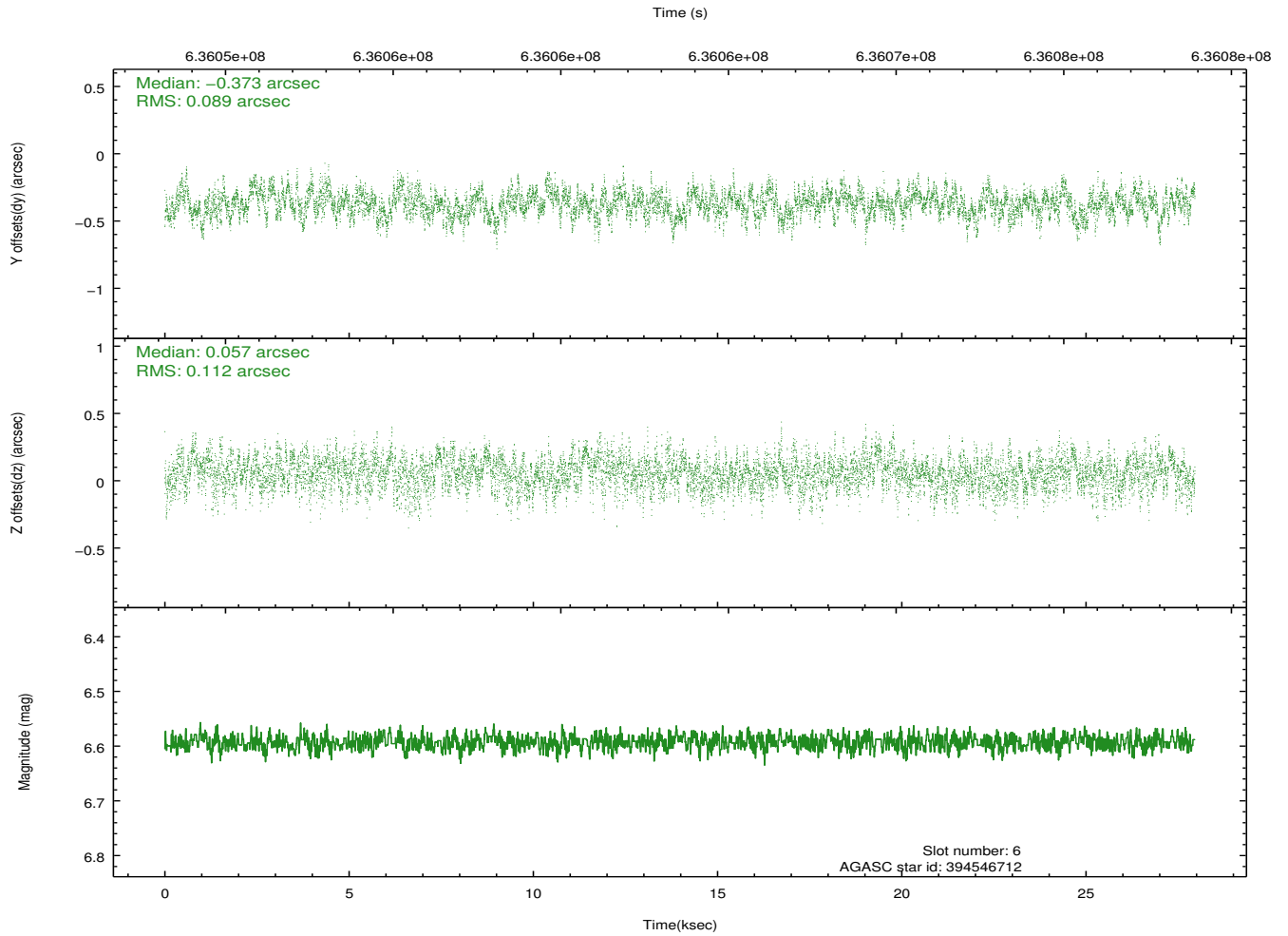
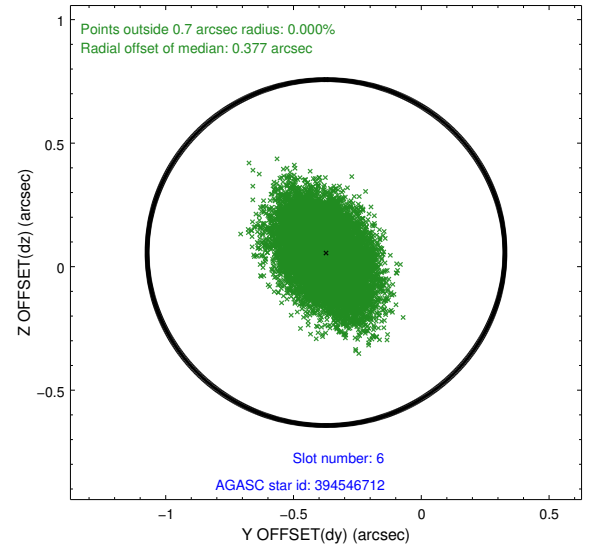
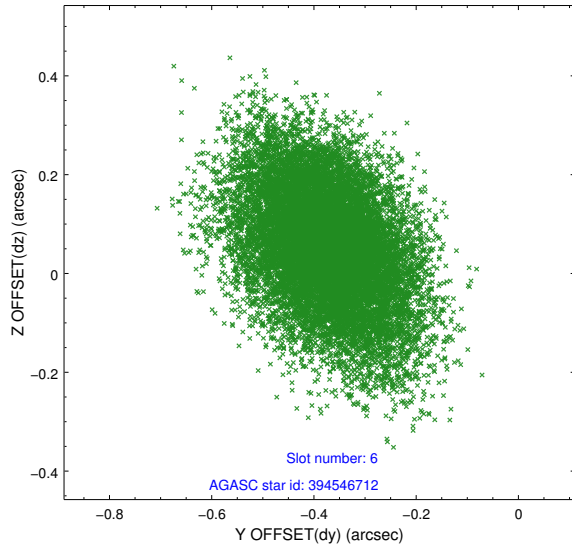
2.4.2 Slot 4



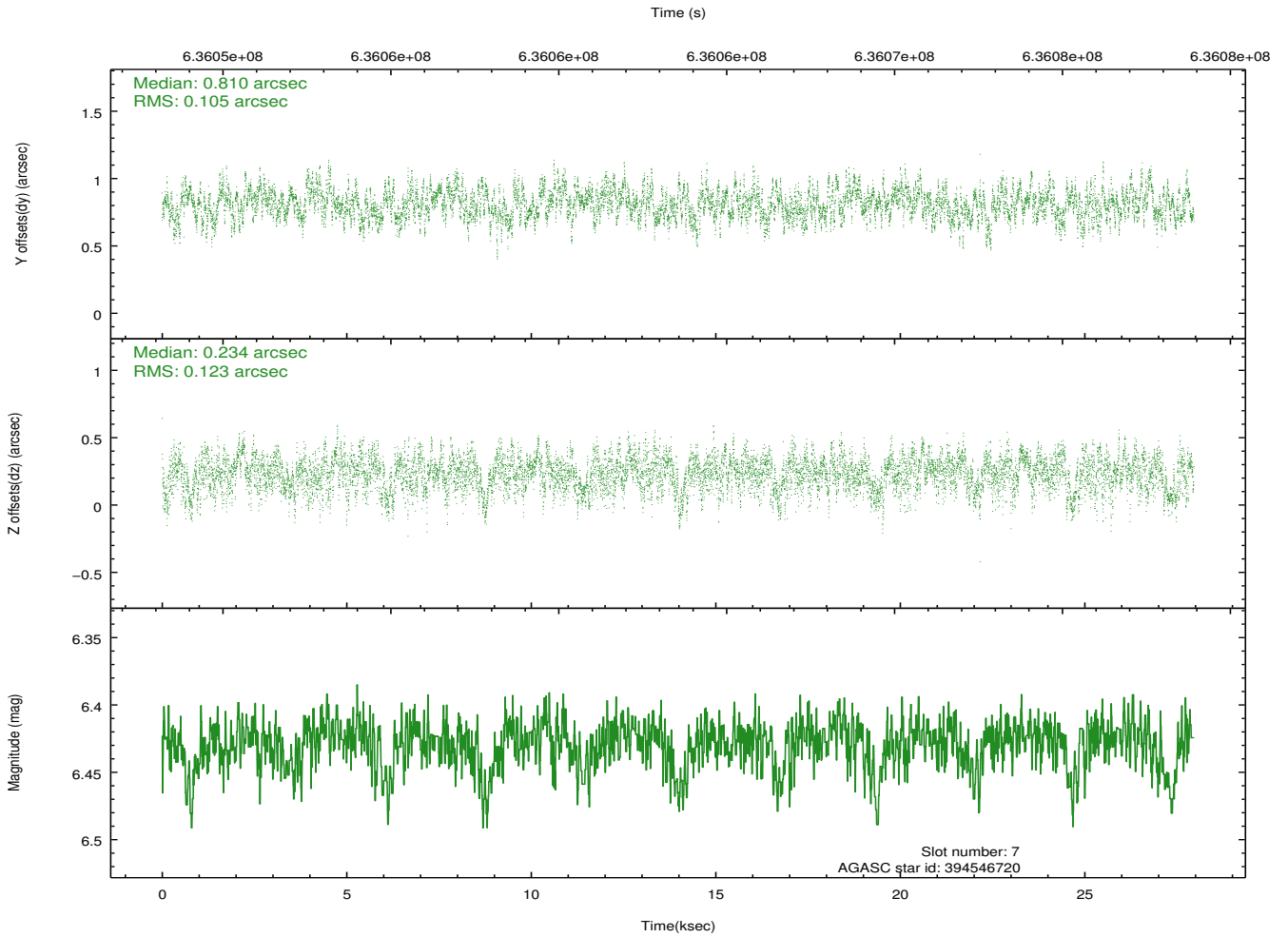
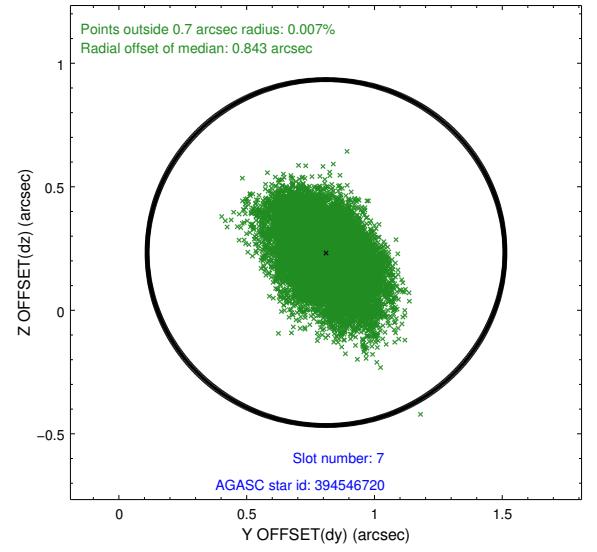
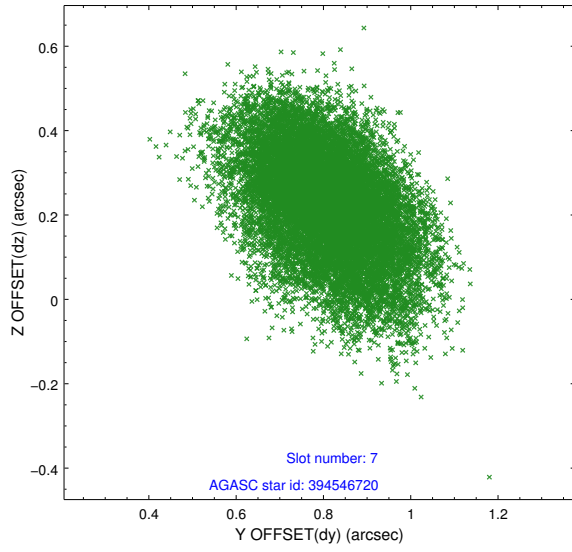
2.4.3 Slot 5



2.4.4 Slot 6

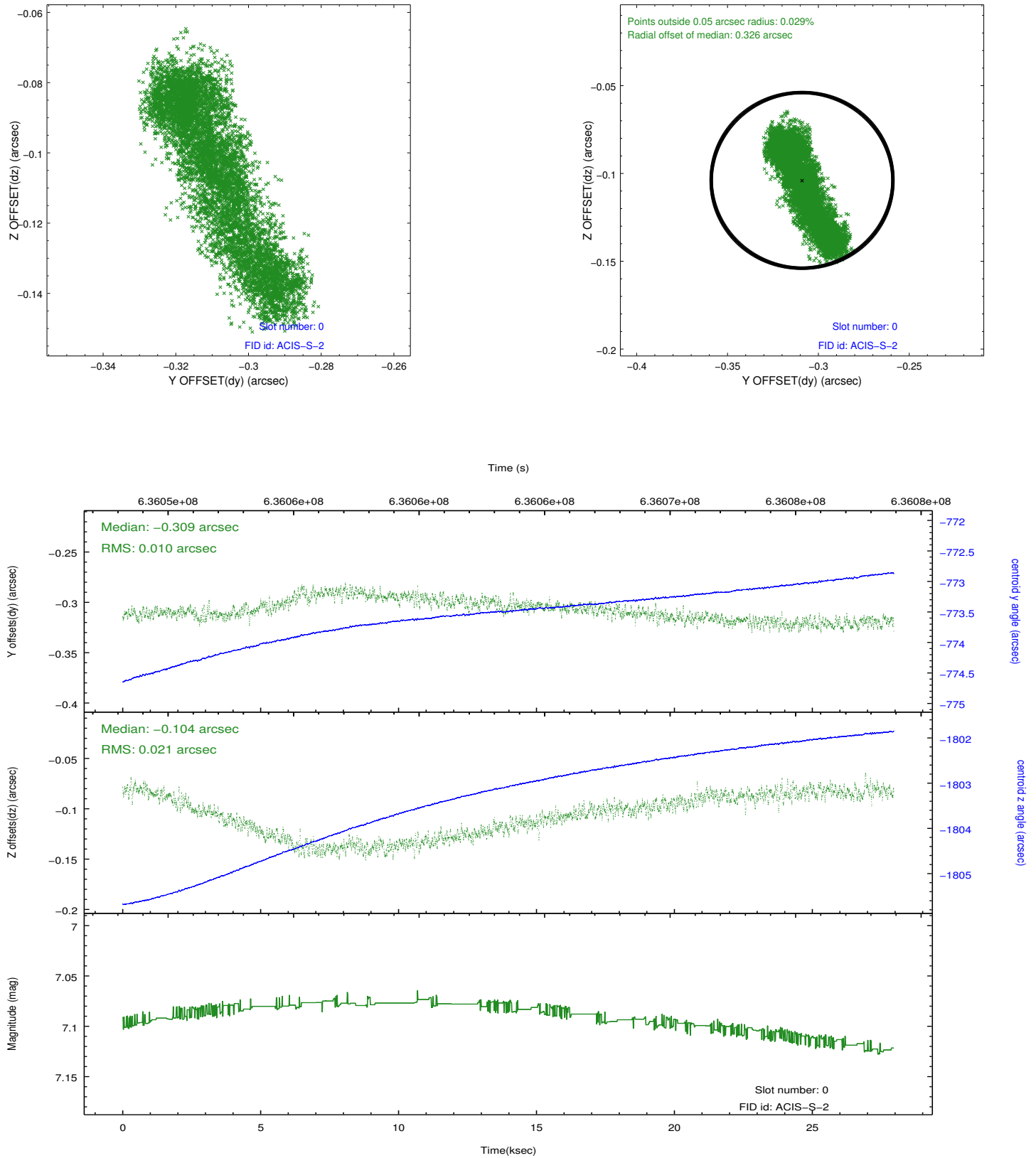


2.4.5 Slot 7

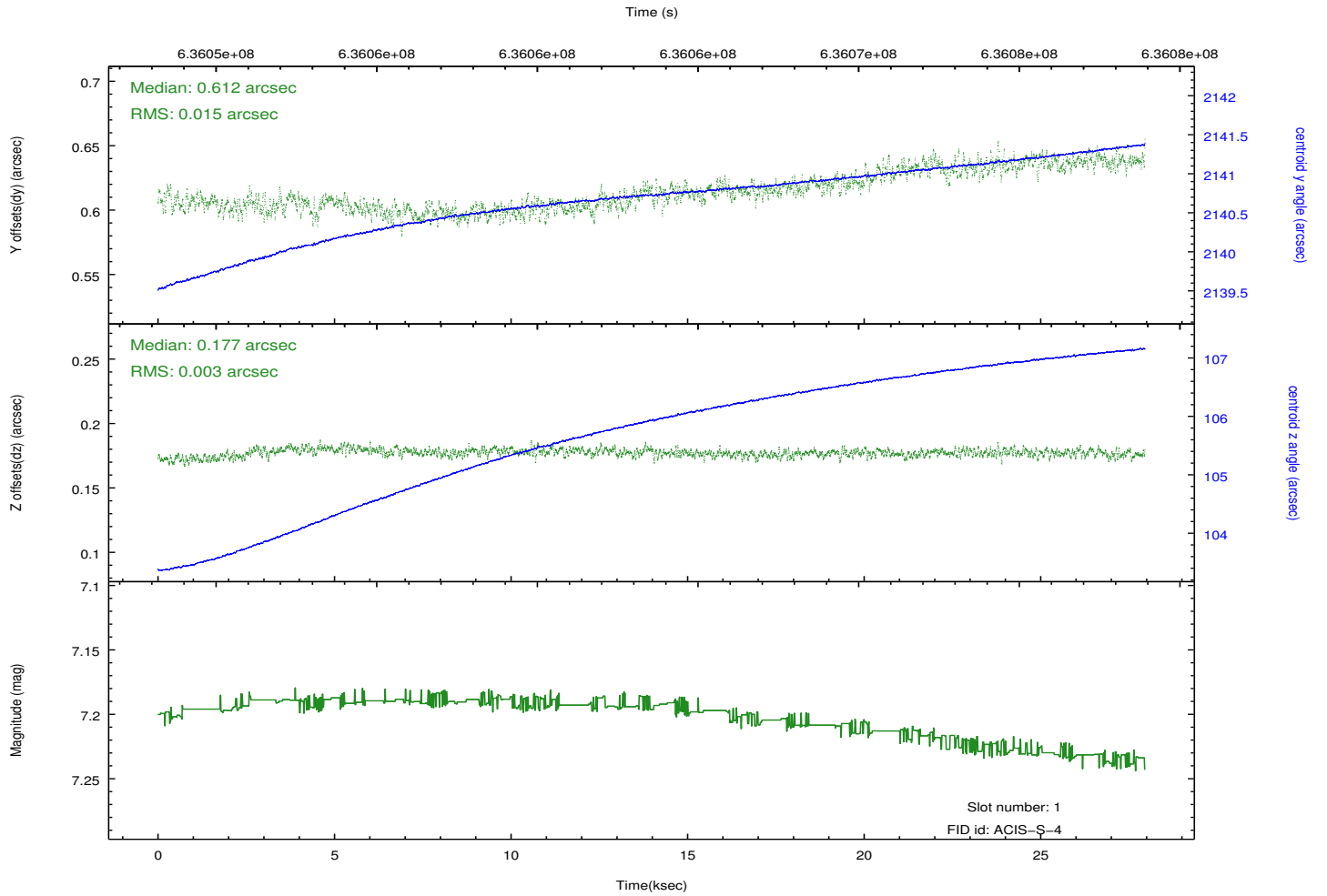
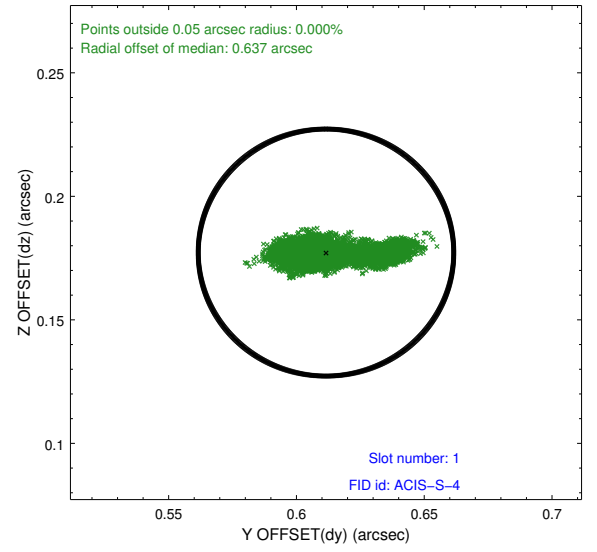
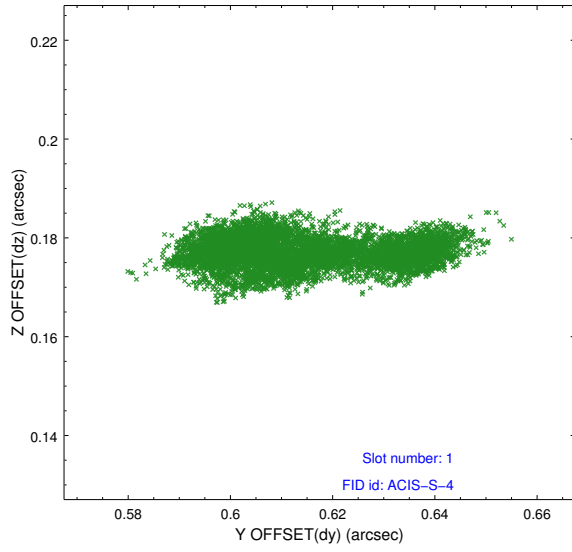


2.5 FID Slots

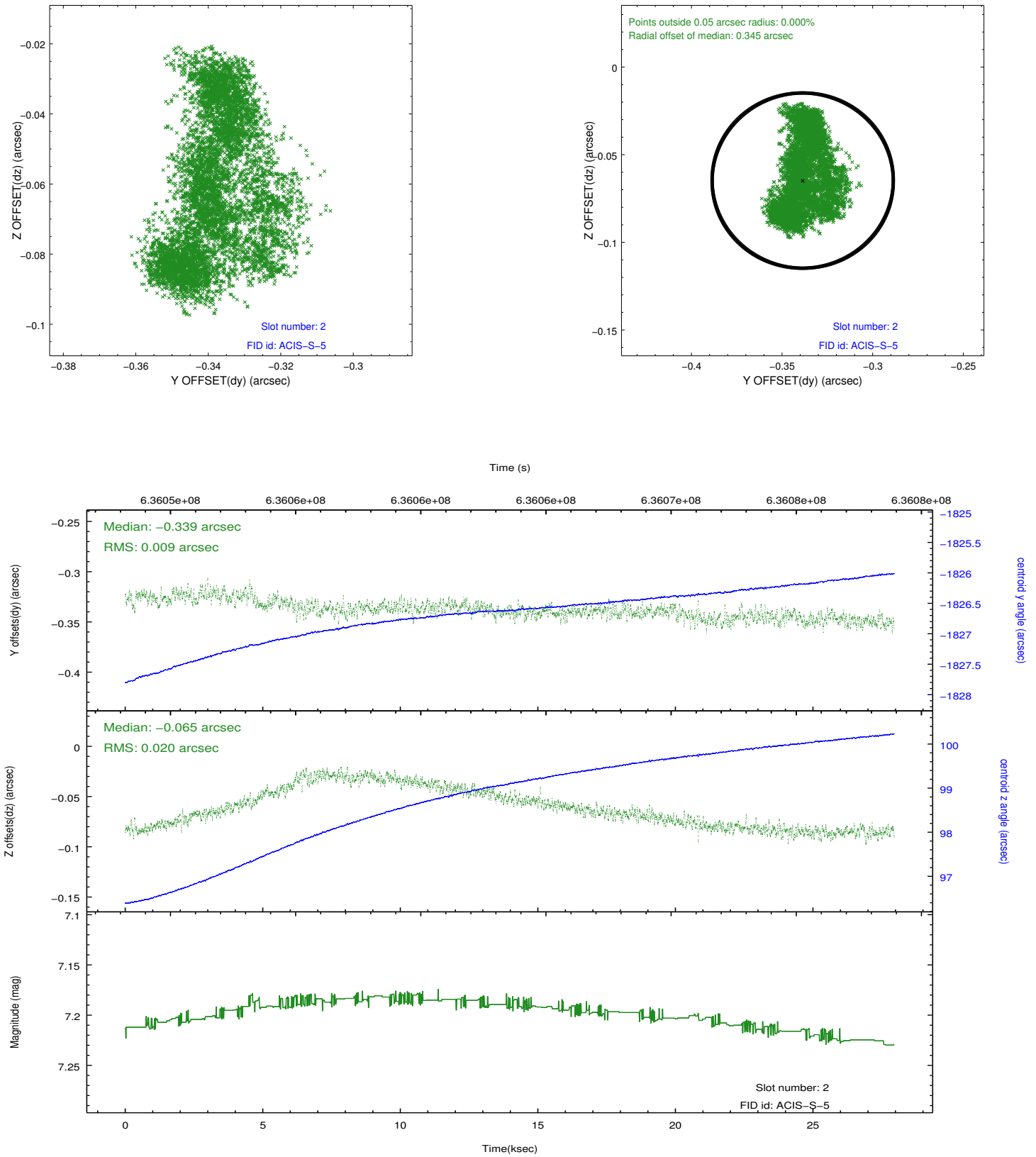
2.5.1 Slot 0



2.5.2 Slot 1

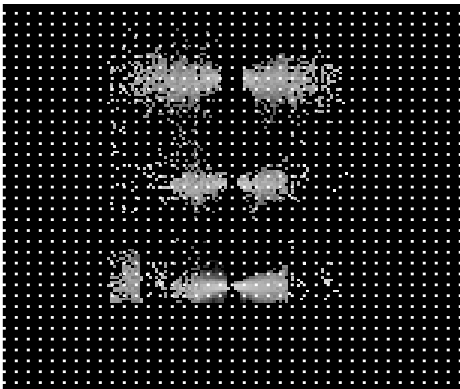


2.5.3 Slot 2

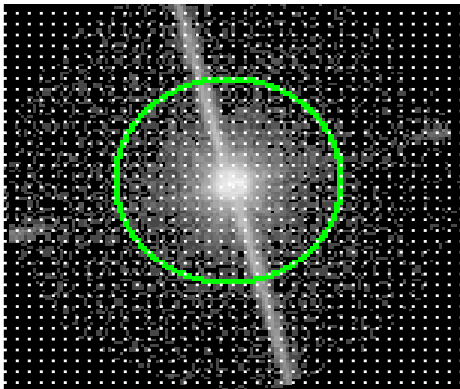


3 Gratings

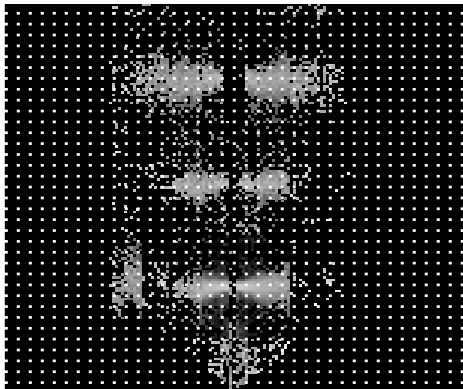
3.1 LETG Arm



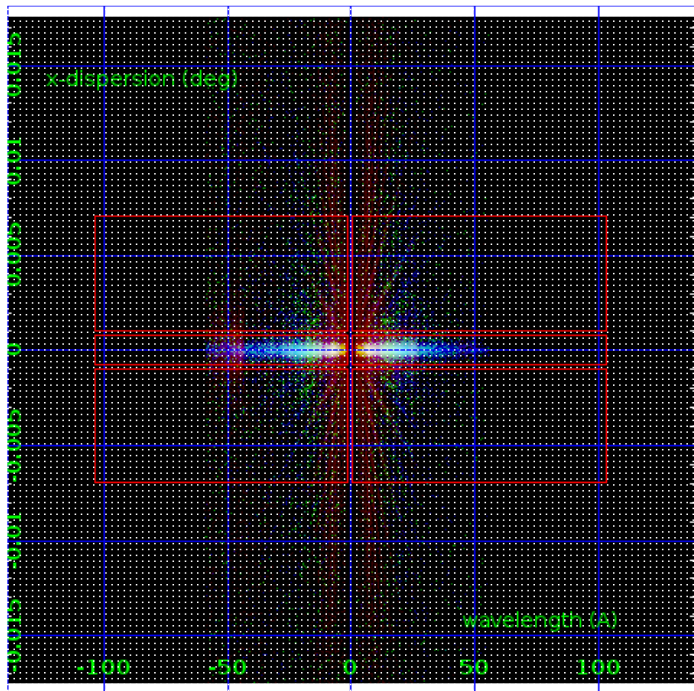
LETG Order Sort 123



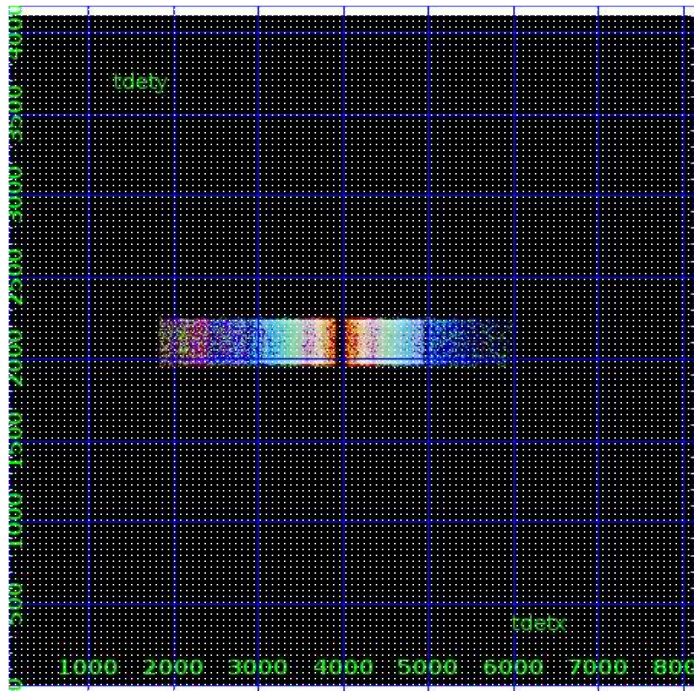
LETG Zero Order



LETG Order Sort ALL

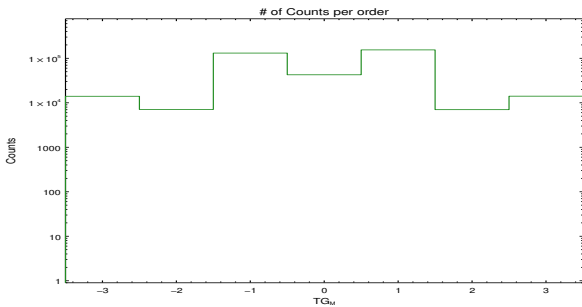


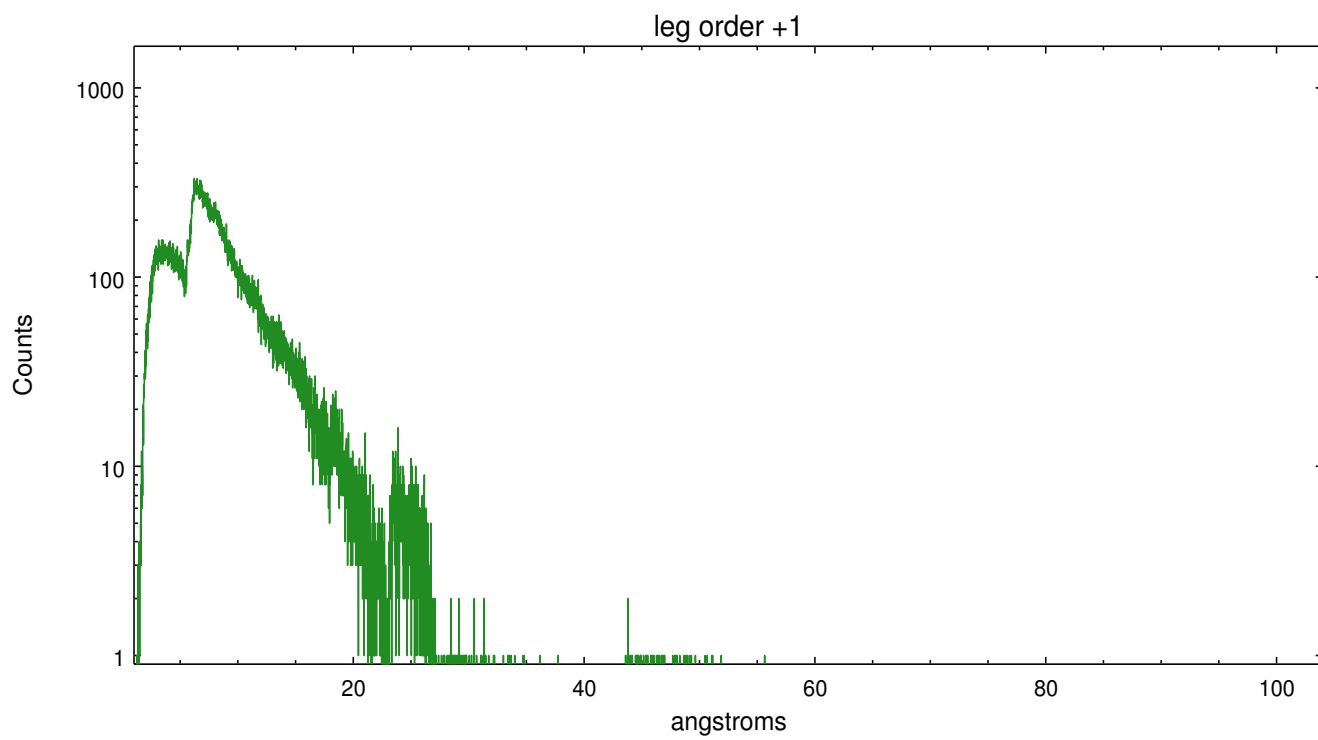
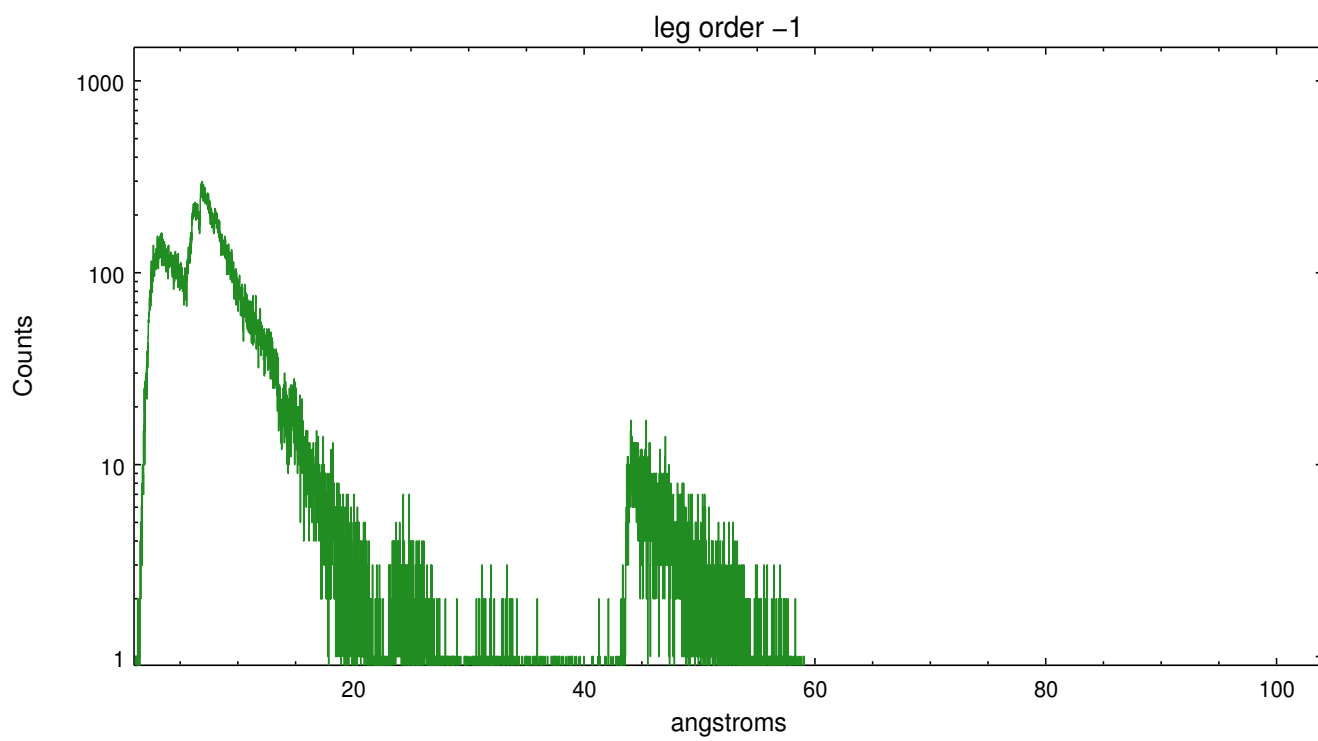
Spot Image LETG



Full Detector LETG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	14007	7083	131039	42637	154650	7015	14081





A Summary

A.1 Status

V&V Scientist	Jen Lauer
V&V Date (YYYY-MM-DD)	2018.02.27
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	27.927470623732

A.2 Comments

Note: this is a calibration observation with a large dither amplitude perpendicular to the dispersion; it will have a changing response with time due to the spatial non-uniformity to the spatial non-uniformity of the filter contamination.

===

Zeroth order very close to chip gap, Apparently not dithered in to chip gap.

===

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.