

V&V Reference Report

L2 ASCDS Version : 10.7.1

Observation 21457 - L2 Version 1
Chandra X-Ray Center

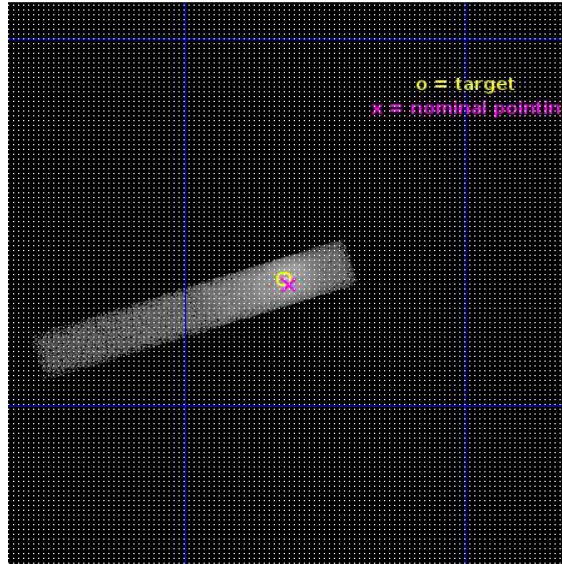
L2 Processing Date : Mar 27 2019

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1 Front

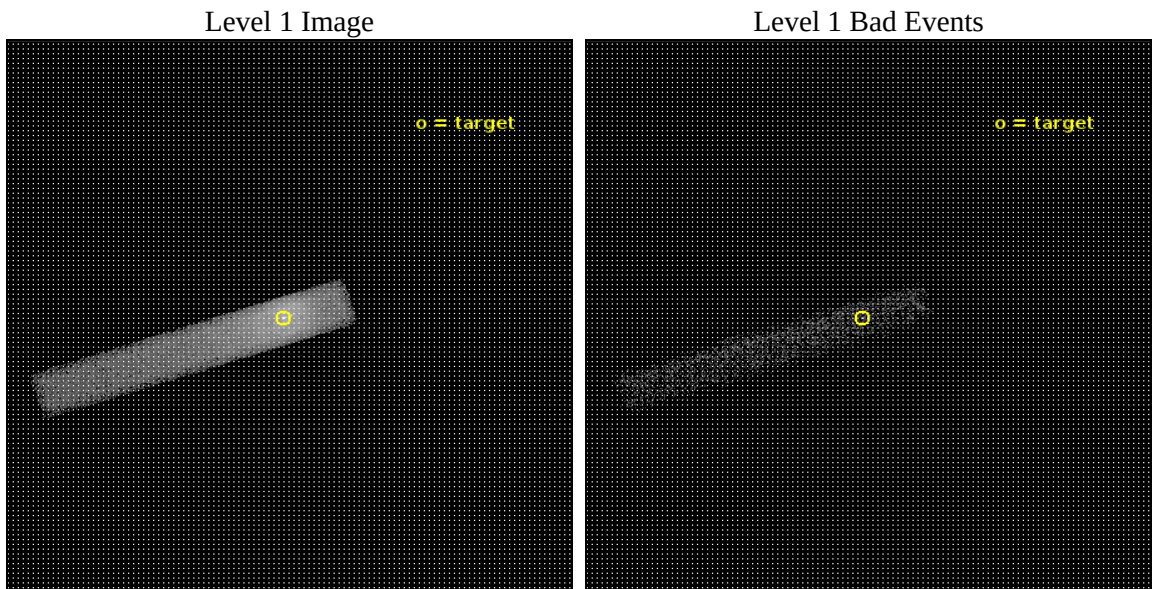
seq_num	703754	Sequence number
obs_id	21457	Observation id
title	Event Horizon Dynamics: Joint Chandra/EHT Imaging of Sgr A* and M87	
observer	Daryl Haggard	Principal investigator
object	M87	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	187.705833	Observer's specified target RA [deg]
dec_targ	12.391111	Observer's specified target Dec [deg]
ra_nom	187.70312951863	Nominal RA [deg]
dec_nom	12.388336399438	Nominal Dec [deg]
roll_nom	162.15721570555	Nominal Roll [deg]
revision	1	Processing version of data
ontime	15569.96036005	Sum of GTIs [s]
livetime	14121.132196672	Livetime [s]
ontime7	15569.96036005	Sum of GTIs [s]
l2events	81724	Number of level 2 events



2 OBI

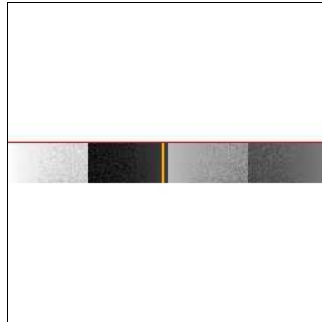
2.1 OBI

2.1.1 Images



2.1.2 Bias

Chip 7



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	15500.000000	[s] Scheduled observation exposure time
ascdsver	10.7.1	Processing system revision	ontime	15569.96036005	Sum of GTIs [s]
caldsver	4.8.2	 	ontime7	15569.96036005	Sum of GTIs [s]
date	2019-03-28T01:38:51	Date and time of file creation	l1events	94578	Number of level 1 events
revision	1	Processing version of data			

2.1.4 Events

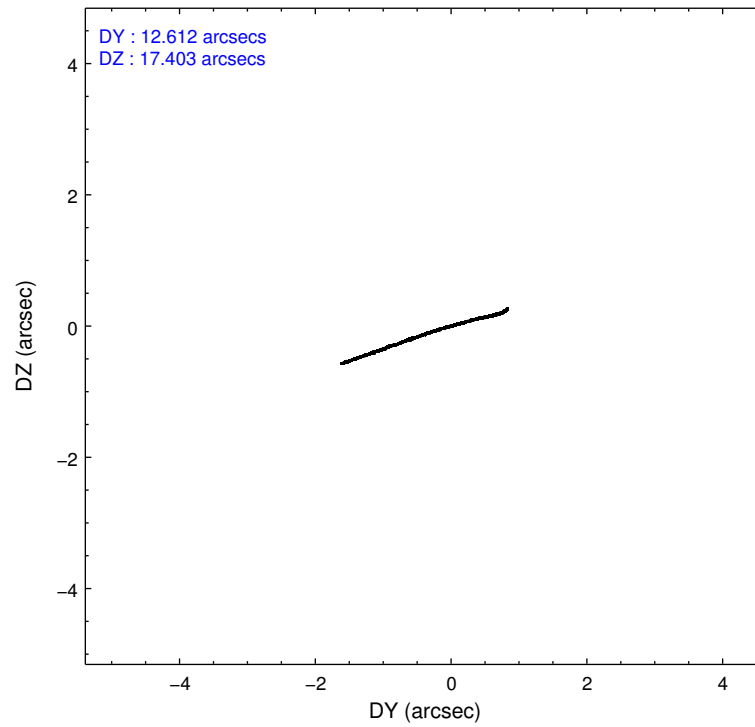
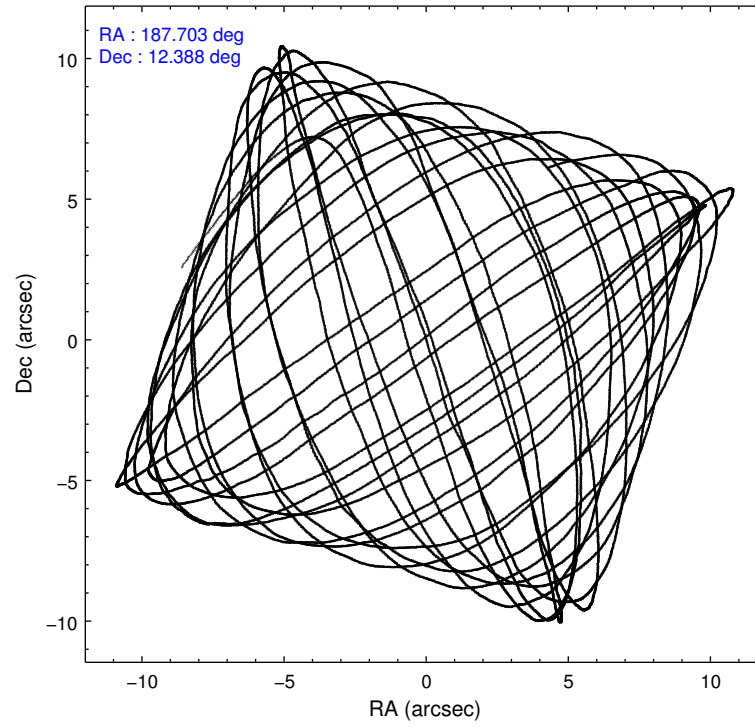
	ccd 7
level 1 events	94578
rejected events	11851
rejected %	12%

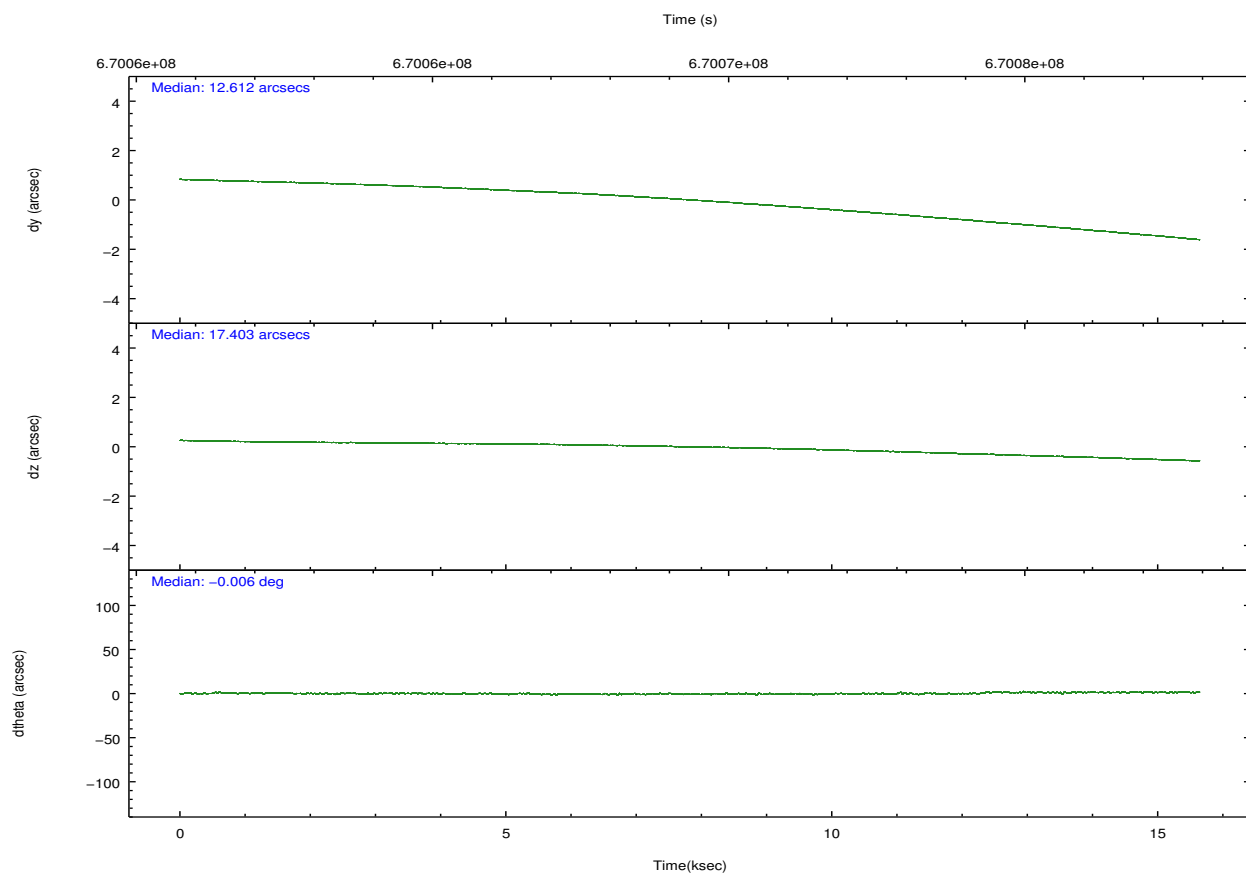
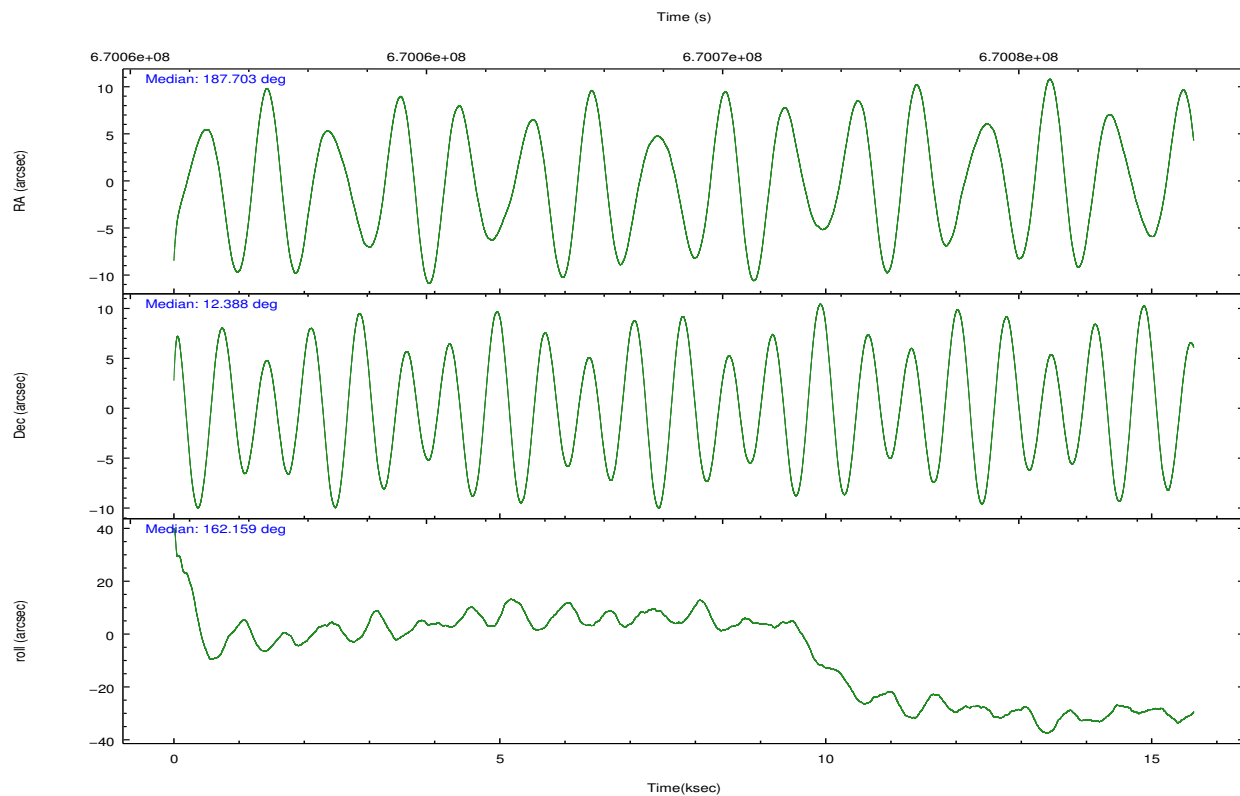
	ccd 7
grade 0 events	21048
	22%
grade 1 events	48
	0%
grade 2 events	21012
	22%
grade 3 events	9985
	10%
grade 4 events	9879
	10%
grade 5 events	2483
	2%
grade 6 events	20808
	22%
grade 7 events	9315
	9%

2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-7	ACIS-7	Obspar file type	PREDICTED	ACTUAL
Grating	NONE	NONE	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	187.730494	187.7031295186293	Subarray requested	CUSTOM	1/8
[deg] Pointing Dec	12.394481	12.38833639943812	Subarray start row	449	449
[deg] Pointing Roll	161.994708	162.1572157055473	Subarray row count	128	128
[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	0.4
[mm] SIM translation stage pos	-190.132523	-190.1425803651734			
[mm] SIM translation stage offset	0	0.01005778216563158			
[s] Observation start time (MET)	670061640.184000	670060605.54019			
Observation start date	2019-03-27T08:12:51	2019-03-27T07:56:45			
[s] Observation end time (MET)	670077140.184000	670077978.26623			
Observation end date	2019-03-27T12:31:11	2019-03-27T12:46:18			
Read mode	TIMED	TIMED			

2.3 Aspect



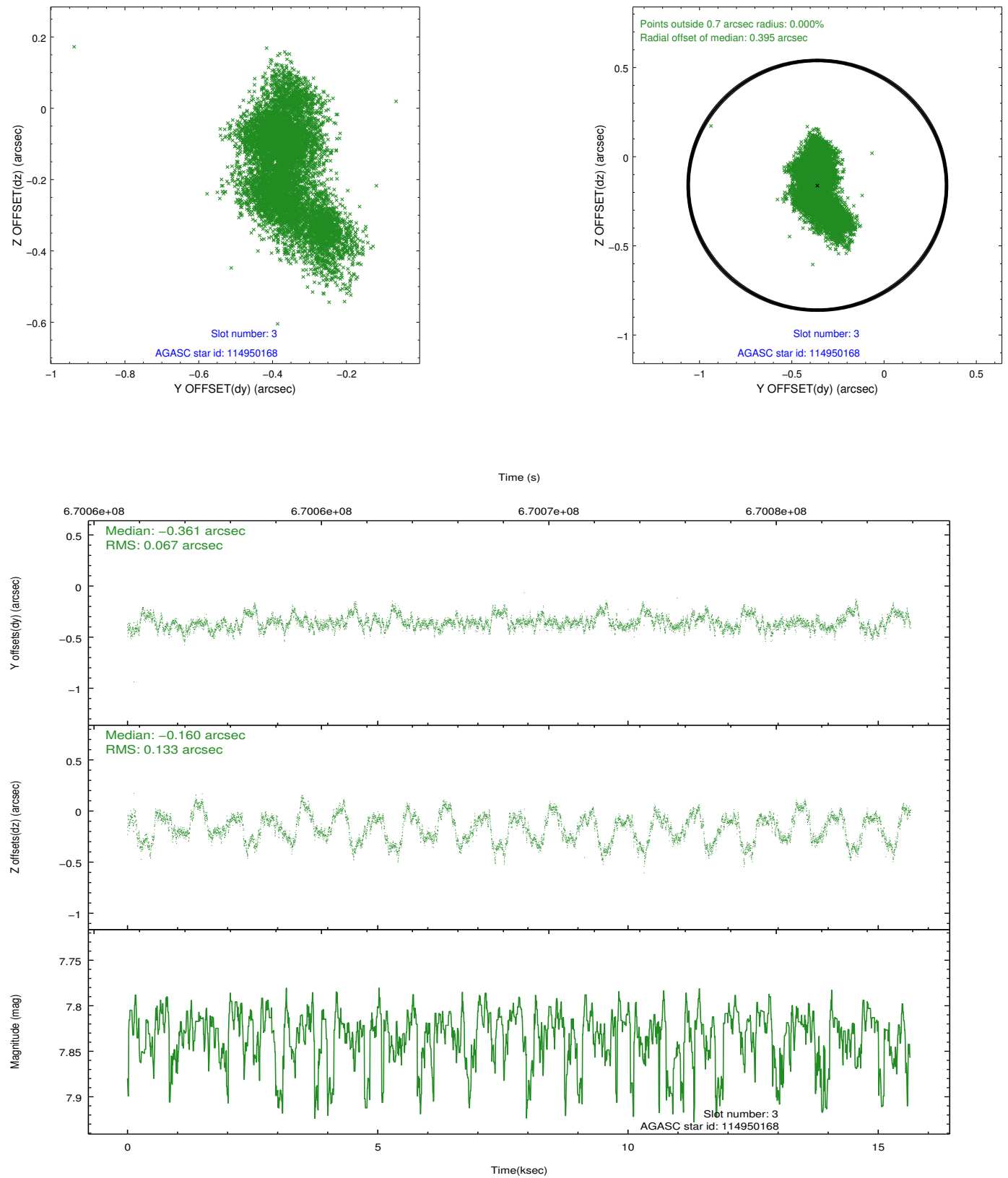


Slot Statistics

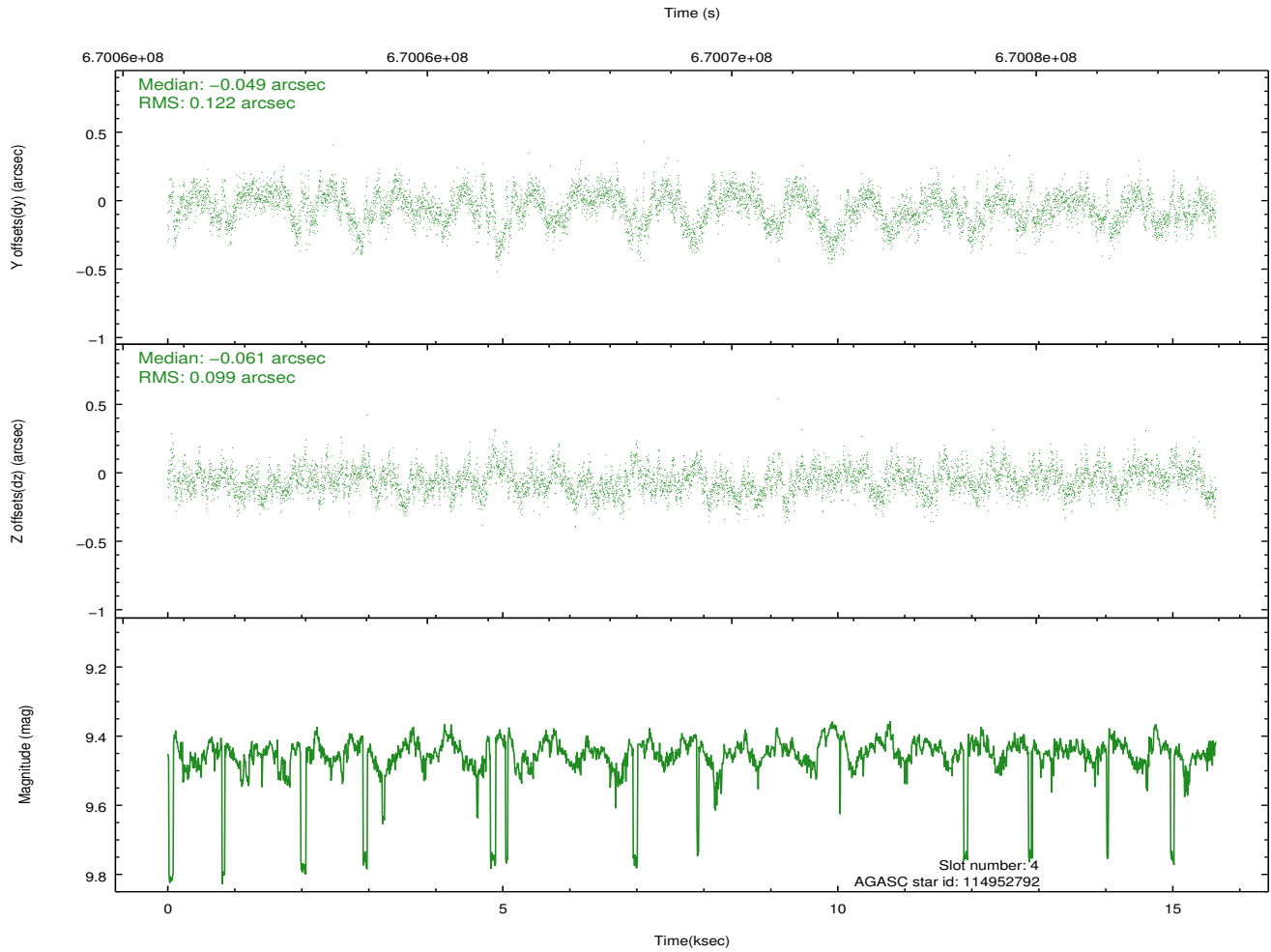
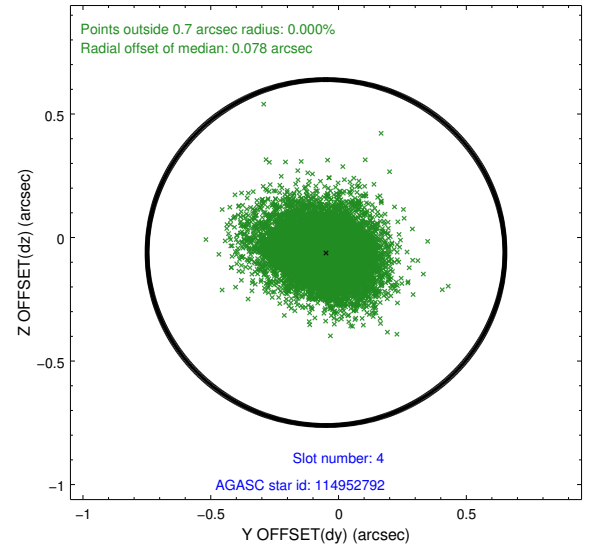
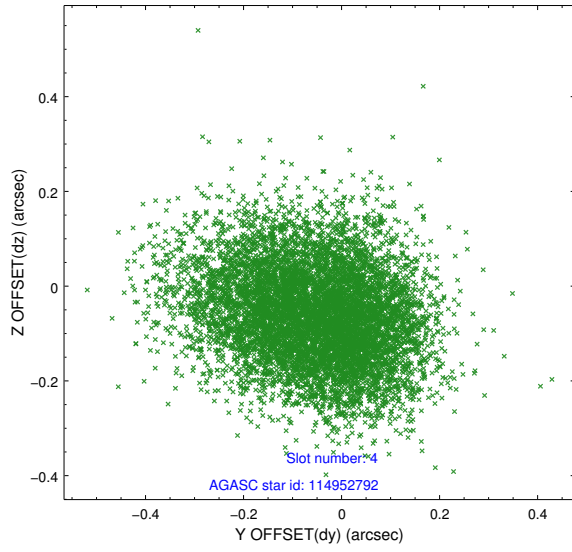
pt	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mea
0	FID		ACIS-S-2	7.18	3816	1.000	-0.241	-0.212	0.023	0.052	0.000000	0.000000	-765.56	-1738
1	FID		ACIS-S-4	7.32	3816	1.000	0.735	0.174	0.022	0.044	0.000000	0.000000	2148.50	169
2	FID		ACIS-S-5	7.29	3816	1.000	-0.532	0.050	0.039	0.095	0.000000	0.000000	-1818.37	163
3	GUIDE	used	114950168	7.83	7628	1.000	-0.361	-0.160	0.156	0.259	187.143398	12.117441	1656.82	1584
4	GUIDE	used	114952792	9.45	7554	1.000	-0.049	-0.061	0.167	0.269	187.070263	12.344747	2155.01	886
5	GUIDE	used	114952824	8.55	7627	1.000	0.272	0.476	0.146	0.220	187.703904	12.486727	192.45	-286
6	GUIDE	used	114955056	8.30	7629	1.000	0.137	-0.058	0.108	0.174	187.914001	12.127854	-909.71	712
7	GUIDE	used	114956144	9.70	7616	1.000	0.000	-0.189	0.230	0.375	187.100545	12.039156	1718.37	1901

2.4 Star Slots

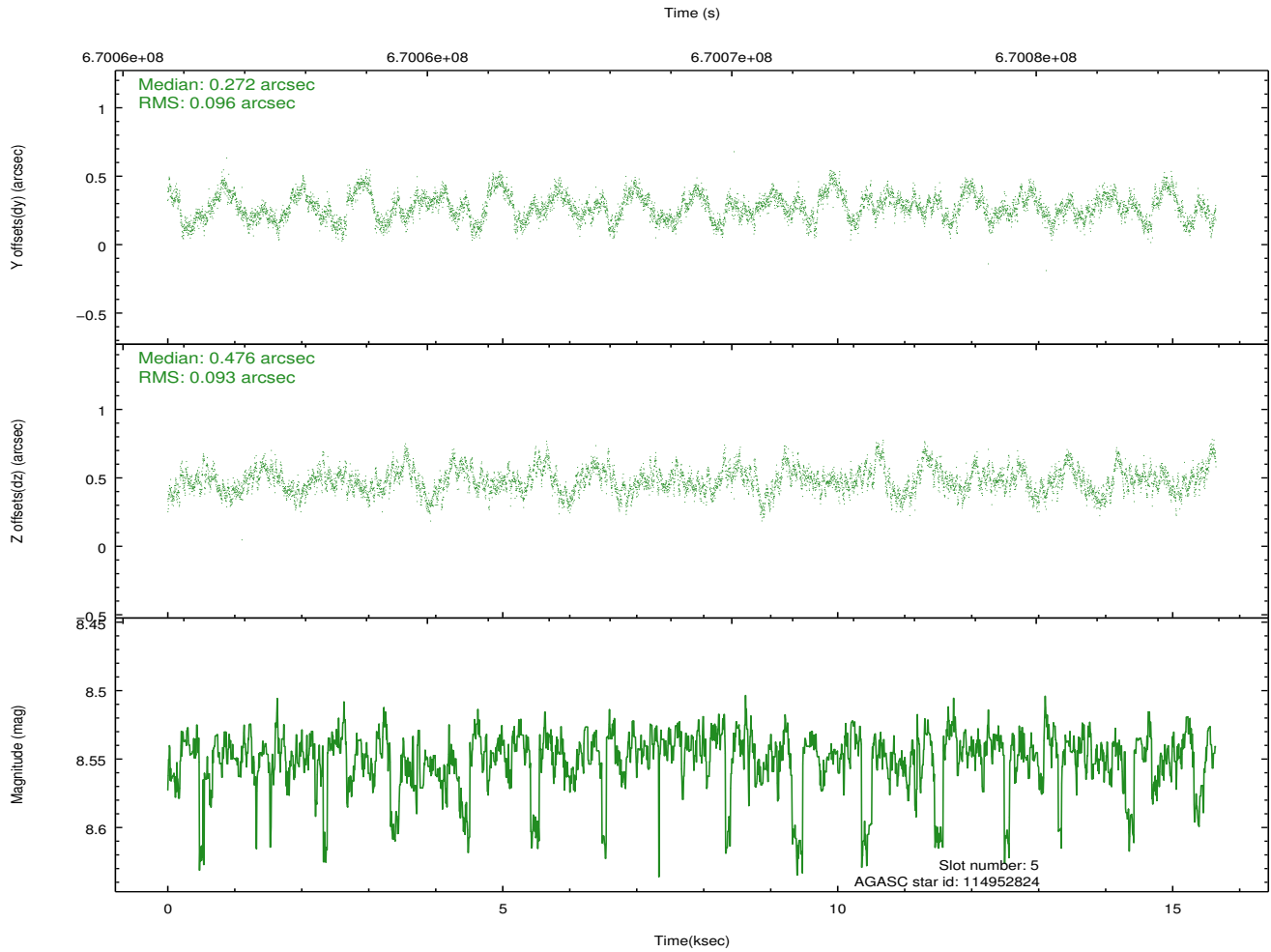
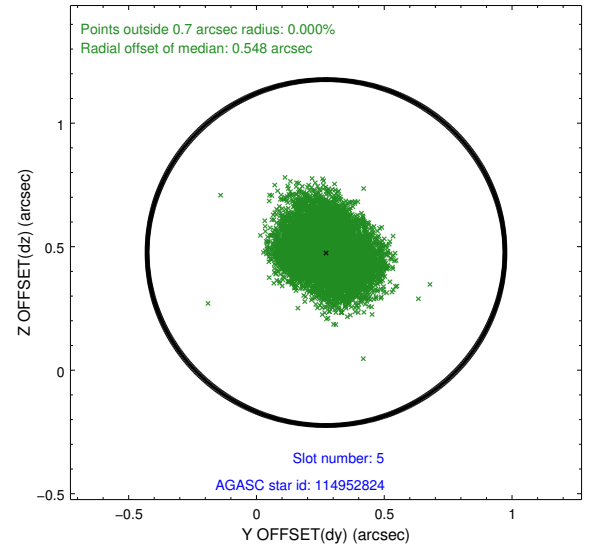
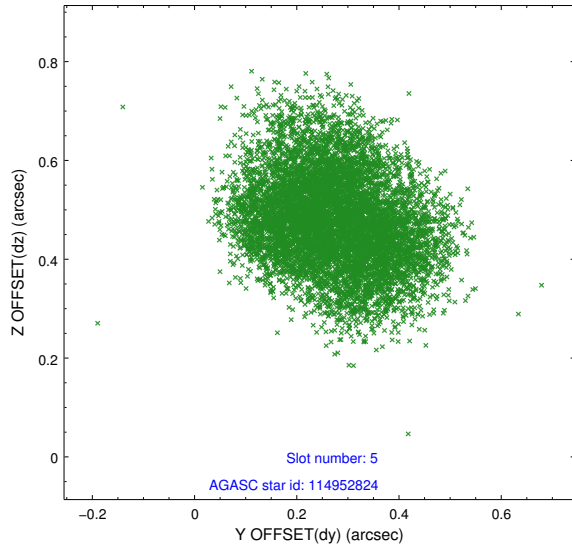
2.4.1 Slot 3



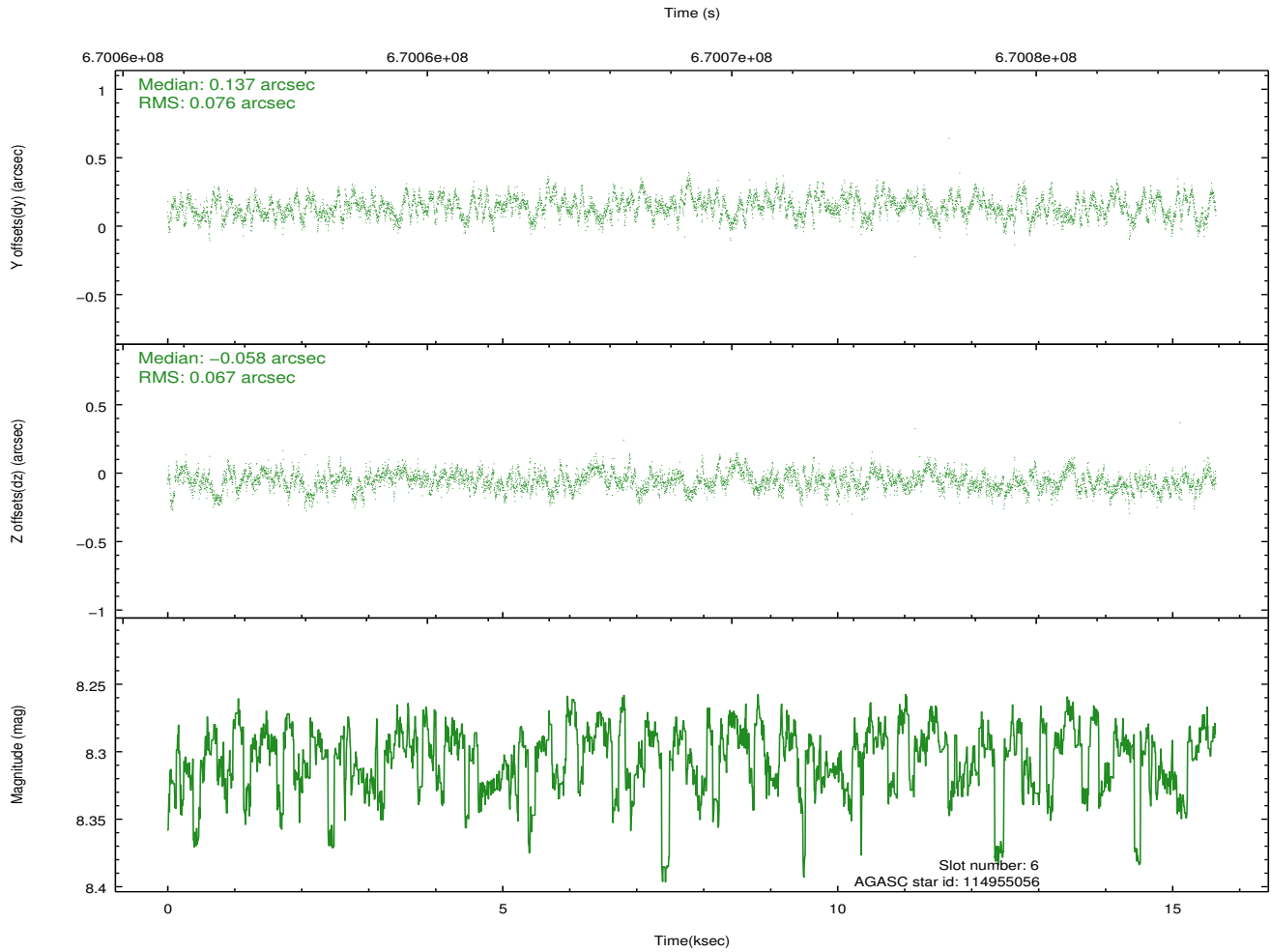
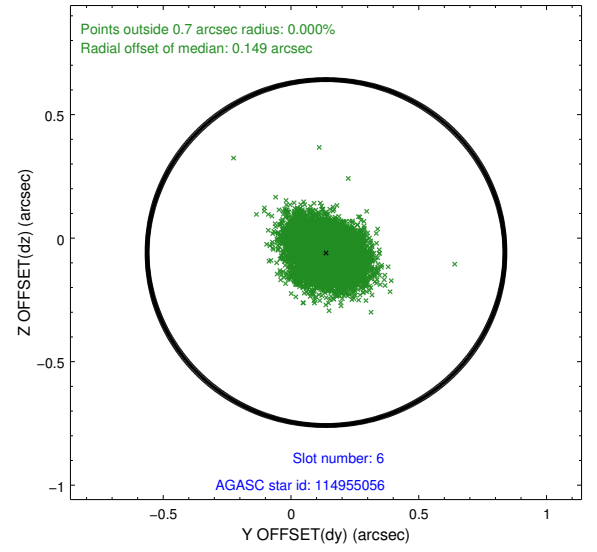
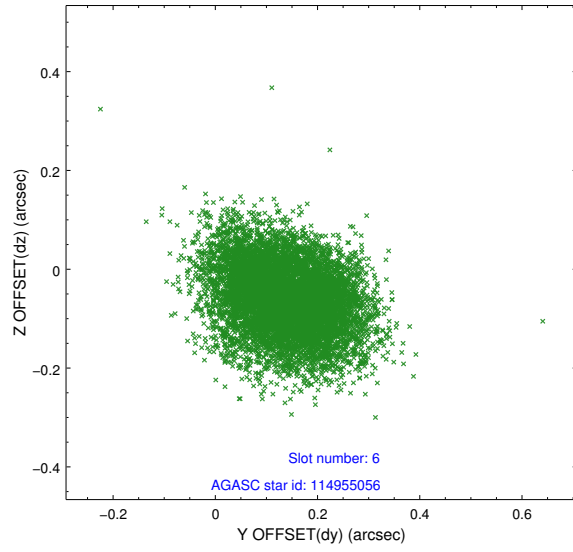
2.4.2 Slot 4



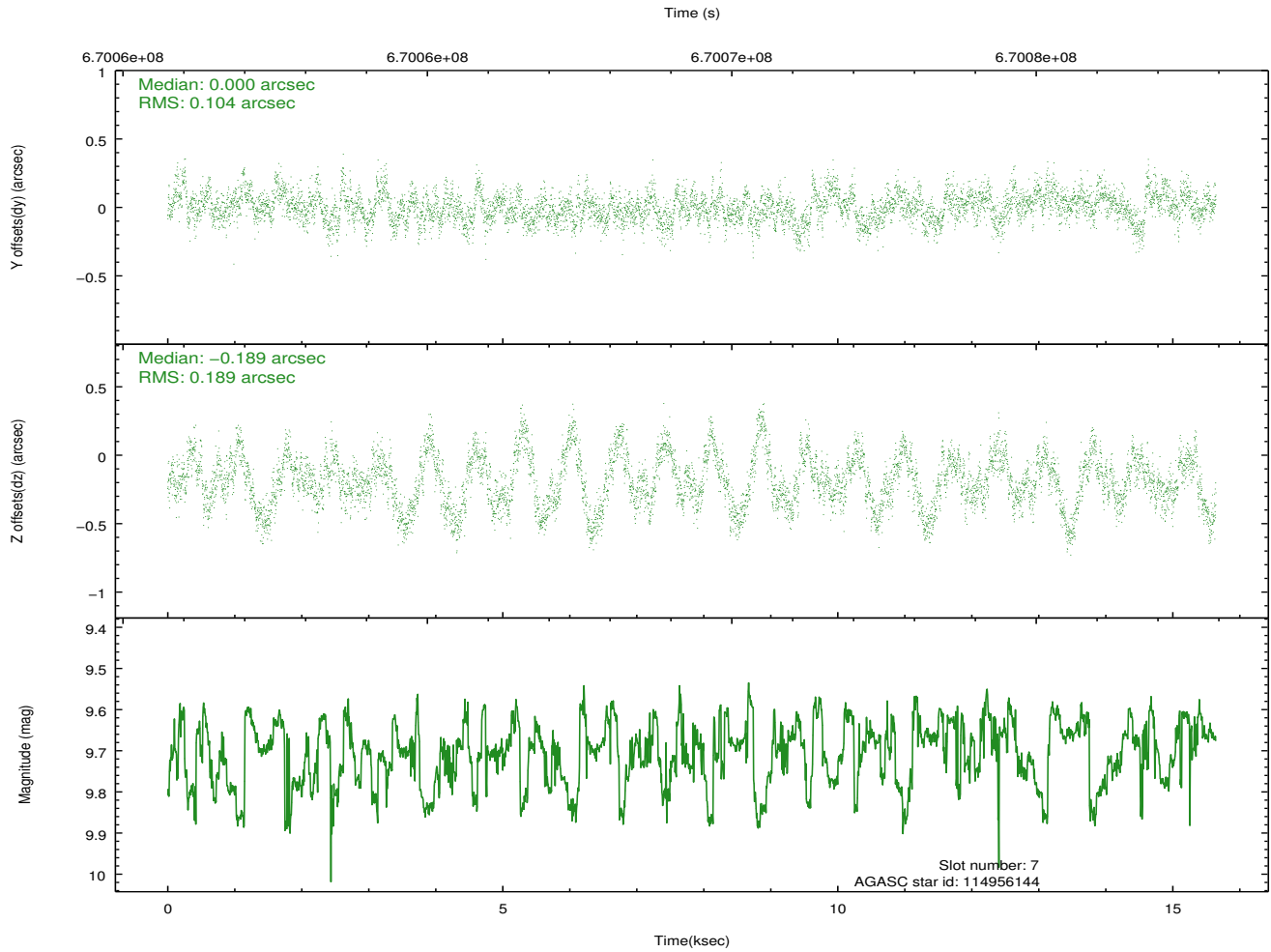
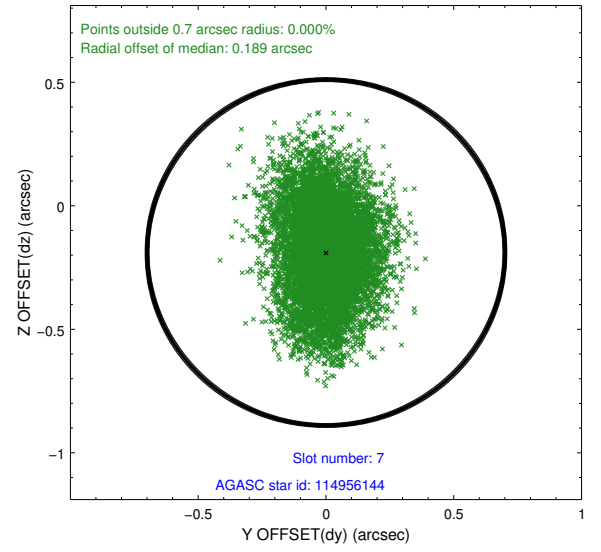
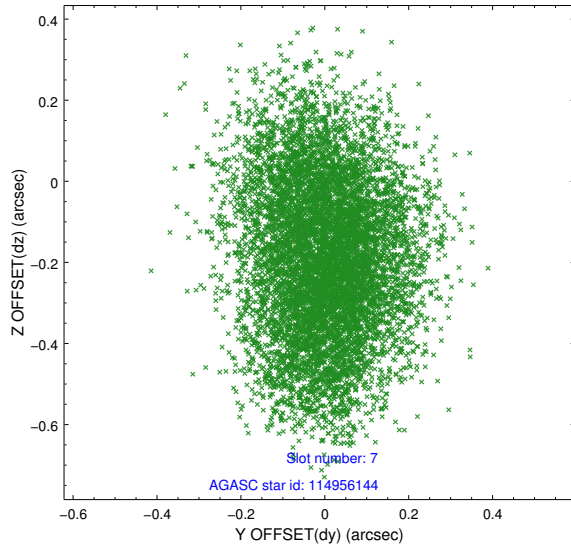
2.4.3 Slot 5



2.4.4 Slot 6

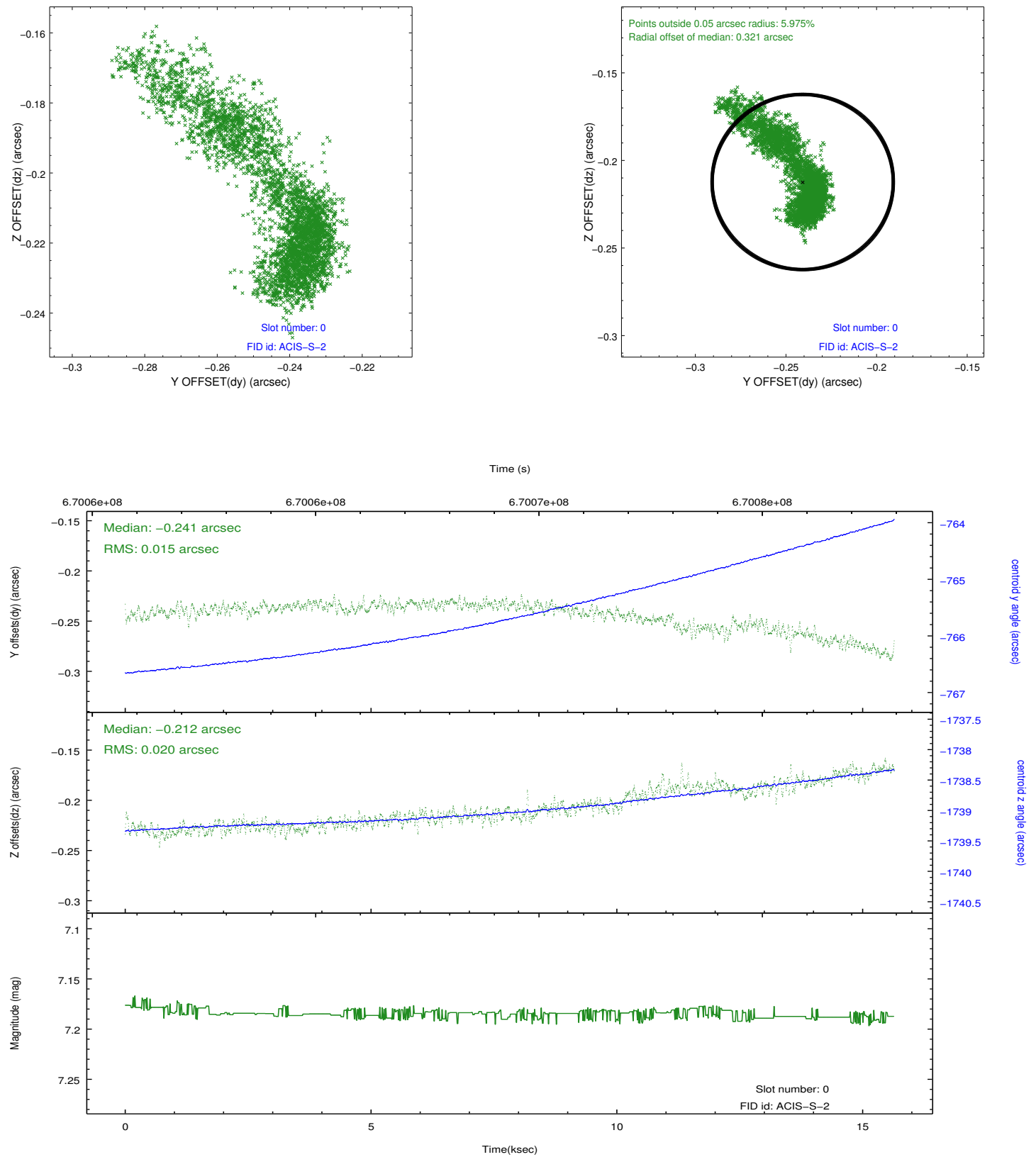


2.4.5 Slot 7

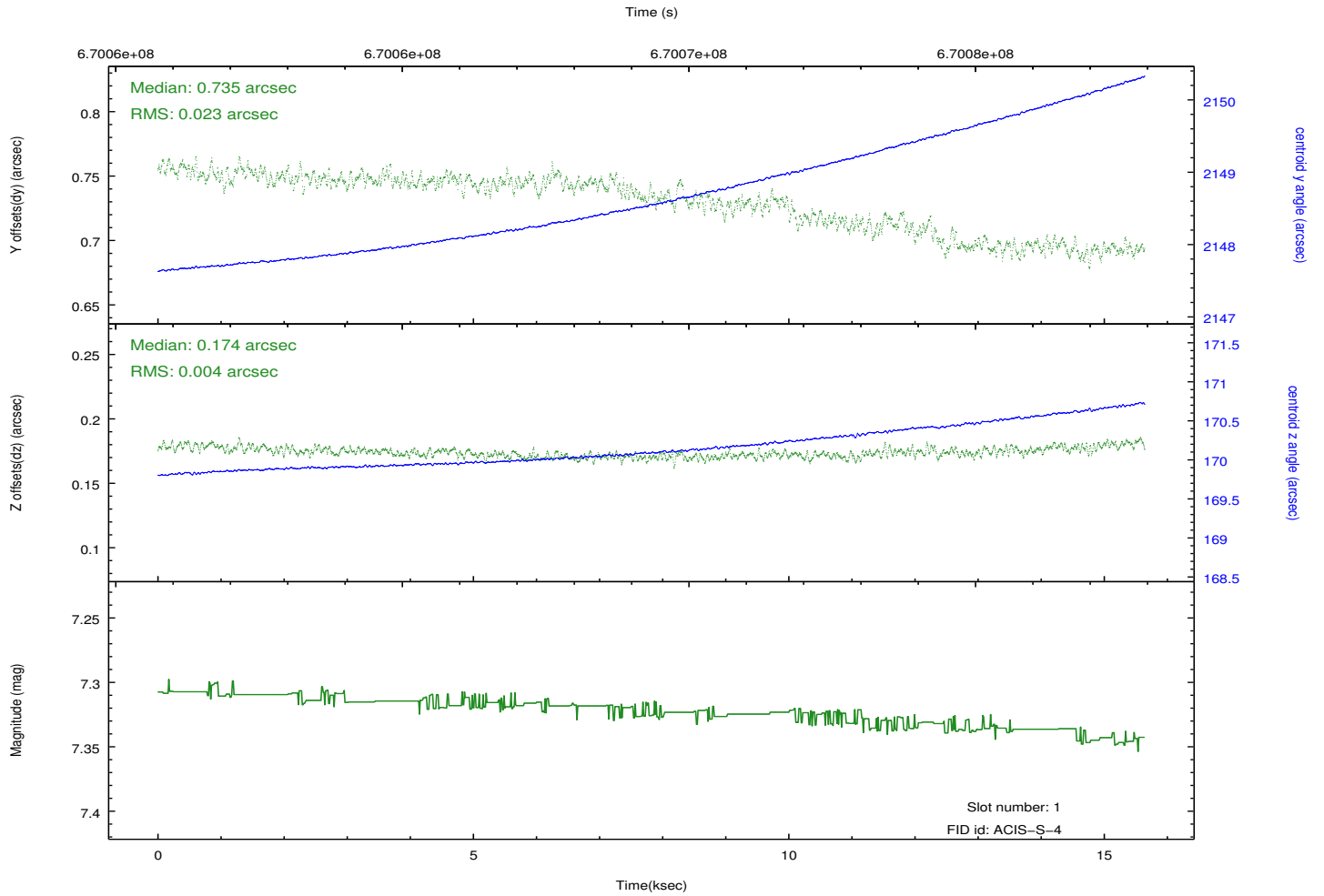
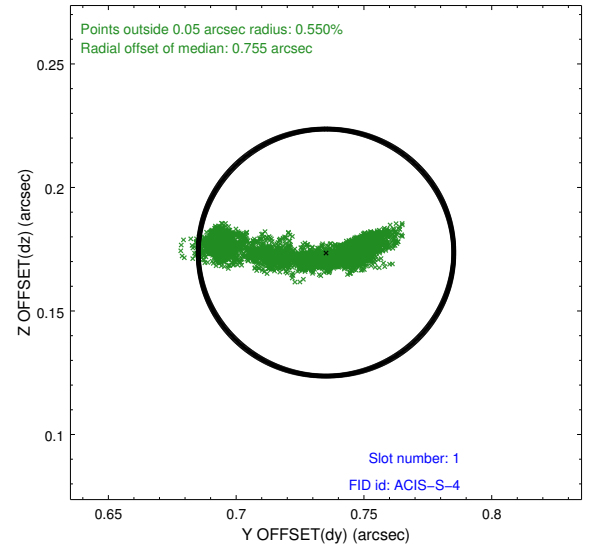
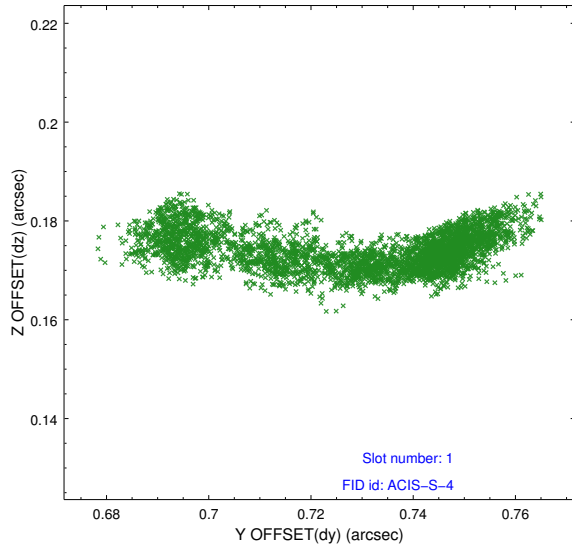


2.5 FID Slots

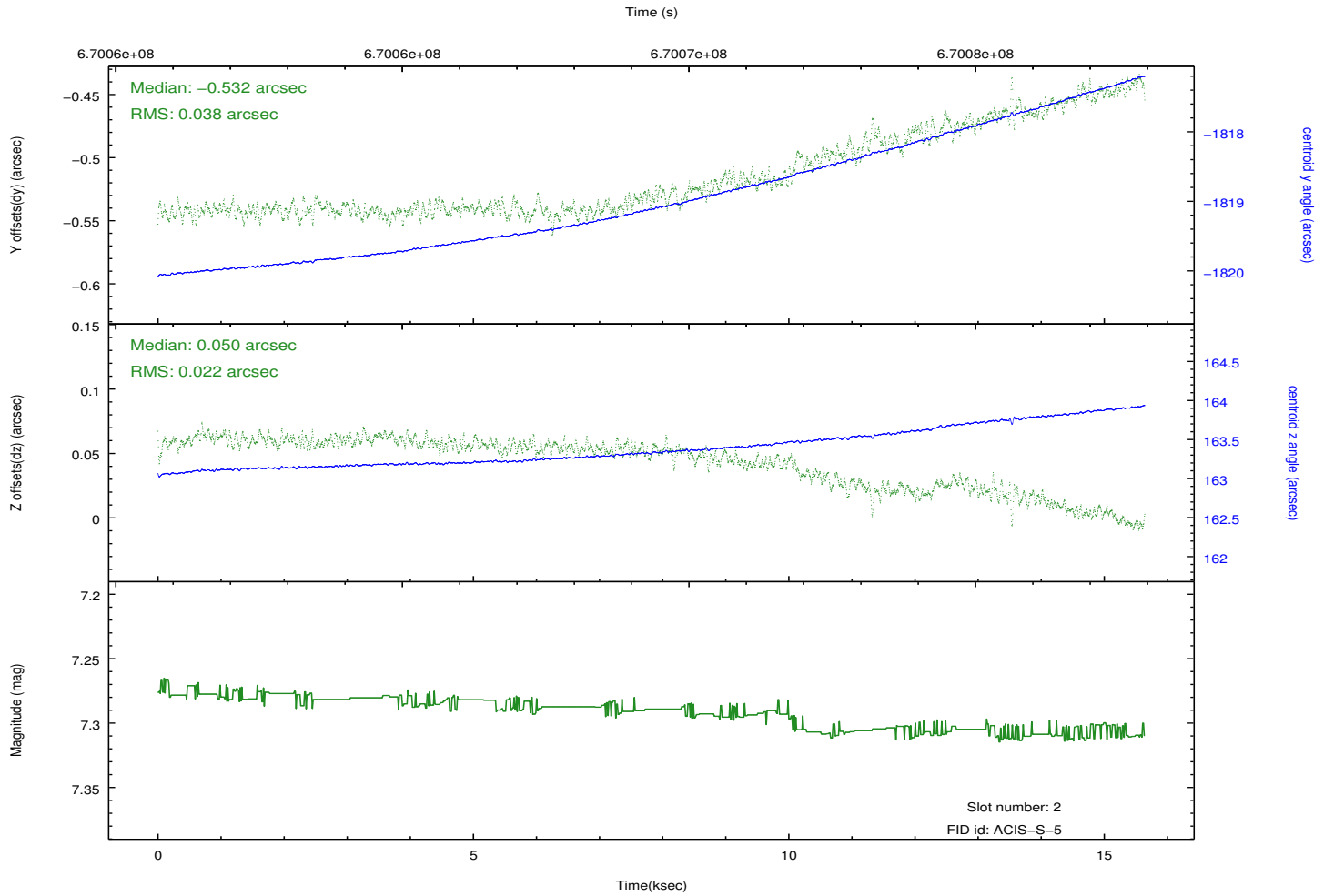
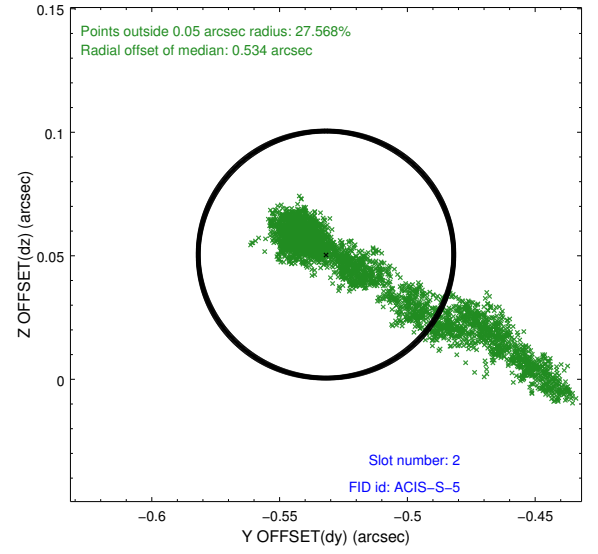
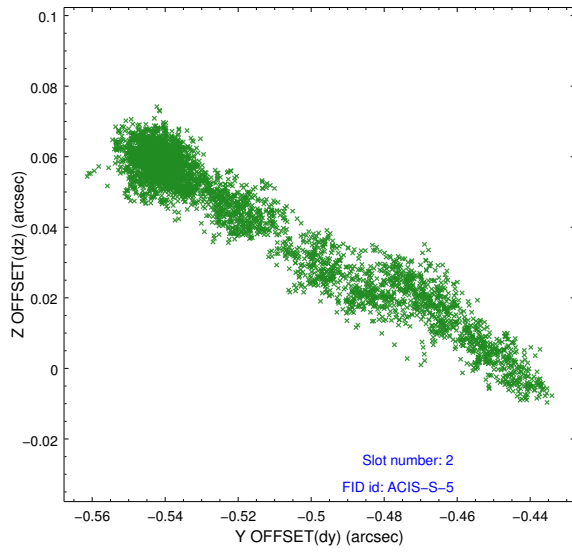
2.5.1 Slot 0



2.5.2 Slot 1



2.5.3 Slot 2



A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2019.03.28
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	15.56996036005

A.2 Comments

The focal plane temperature is warmer than -112.0 C during the interval 670061570.54 - 670077140.14 (MET s) of this observation. The focal plane temperature during that interval was warmer than the upper limit for optimum calibration of the ACIS gain and spectral resolution (i.e., -114.0 C for ACIS-I and -112.0 C for ACIS-S).

The Chandra calibration team calibrates the ACIS gain and spectral resolution using data from the external calibration source (ECS). ECS data show that the frontside-illuminated (FI) CCDs are more temperature sensitive than the backside-illuminated (BI) CCDs.

A summary of the current calibration status of the ACIS gain and spectral resolution can be found at:

http://asc.harvard.edu/cal/Acis/Cal_prods/Gain_and_Spectral_Resolution/ACIS_response_summary.html

The main points are:

- 1) The gain on BI chips remains within 0.3% (i.e., the systematic uncertainty in the ACIS gain quoted on the Chandra Calibration Status Summary web page) at all measured temperatures.
- 2) The gain on FI chips remains within 0.3% below row 600 at all measured temperatures.
- 3) The gain on FI chips above row 600 can be underestimated by as much as 1% for focal plane temperatures exceeding -116 C.
- 4) The spectral resolution (i.e., FWHM) on BI chips is insensitive to the focal plane temperature.
- 5) Warmer focal plane temperatures increase the FWHM on FI chips by up to 30 eV near row 512 and by up to 70 eV near the top of the chips.

In summary, the user should be cautious in the spectral analysis of high S/N emission lines detected on the top half of FI chips in this observation. Default processing with the current version of the CALDB will underestimate photon energies by up to 1% and broaden emission lines by up to 70 eV.