

V&V Reference Report

L2 ASCDS Version : 10.7.1

Observation 22124 - L2 Version 2
Chandra X-Ray Center

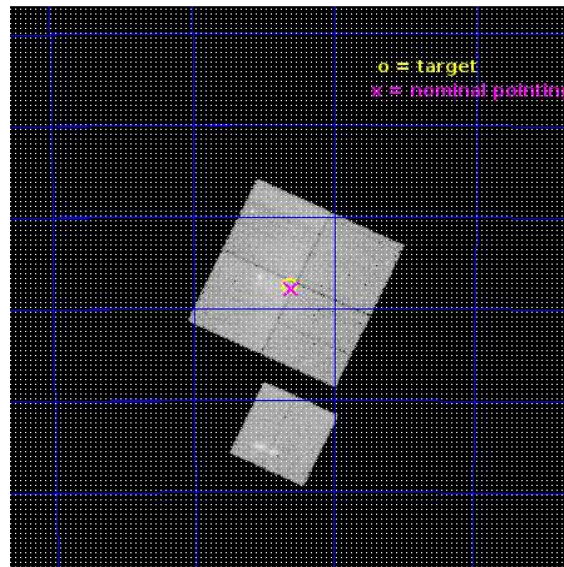
L2 Processing Date : Mar 6 2019

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1 Front

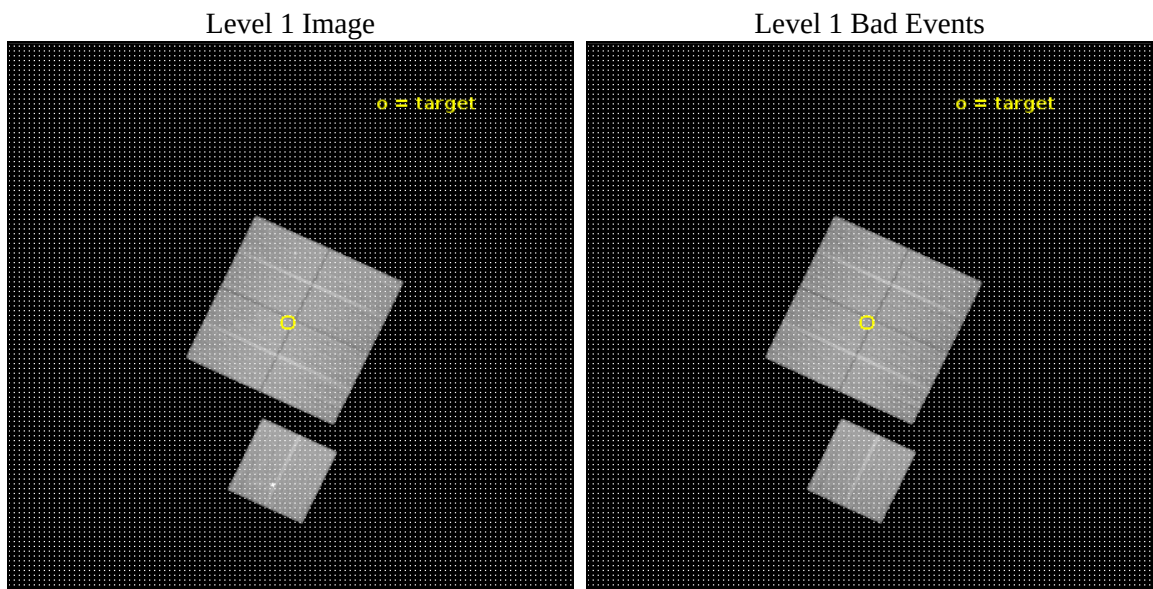
seq_num	801744	Sequence number
obs_id	22124	Observation id
title	Double bullet cluster A4067	Proposal title
observer	Chong Ge	Principal investigator
object	Abell 4067	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	359.660833	Observer's specified target RA [deg]
dec_targ	-60.625806	Observer's specified target Dec [deg]
ra_nom	359.65283179908	Nominal RA [deg]
dec_nom	-60.631150411549	Nominal Dec [deg]
roll_nom	205.20170238308	Nominal Roll [deg]
revision	2	Processing version of data
ontime	42054.51839304	Sum of GTIs [s]
livetime	41505.045150149	Livetime [s]
ontime0	42060.800323606	Sum of GTIs [s]
ontime1	42054.518383026	Sum of GTIs [s]
ontime2	42057.659442782	Sum of GTIs [s]
ontime3	42054.51839304	Sum of GTIs [s]
ontime6	42060.800323606	Sum of GTIs [s]
l2events	171260	Number of level 2 events



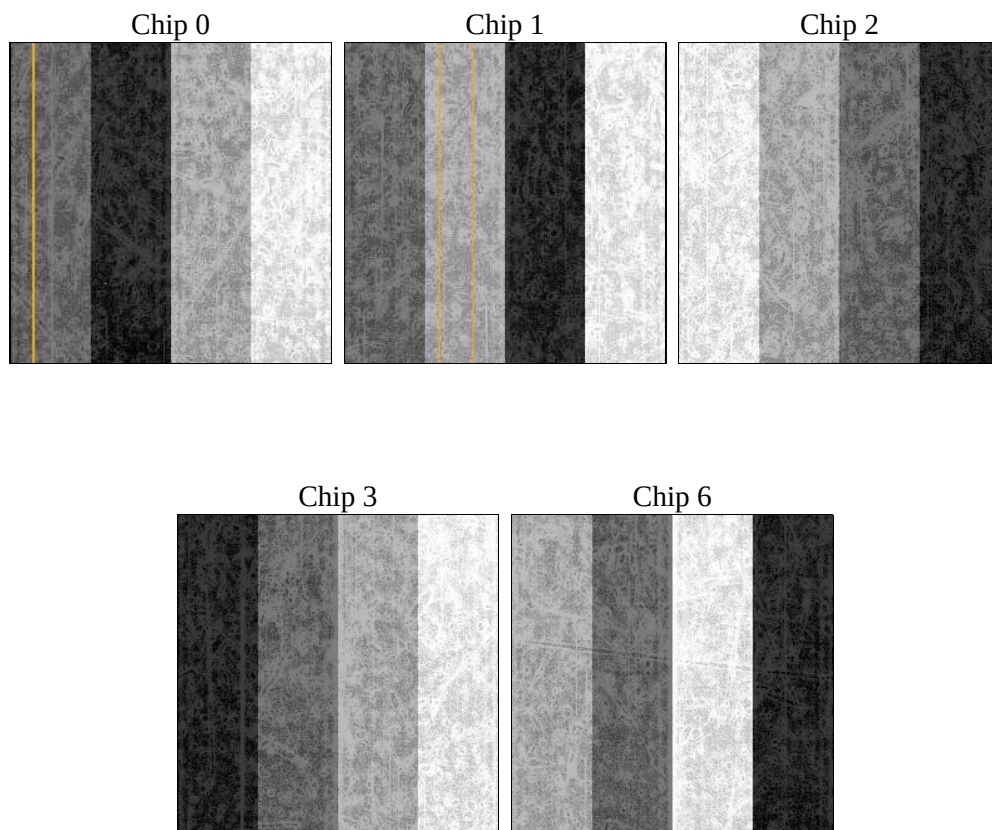
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	42000.000000	[s] Scheduled observation exposure time
ascdsver	10.7.1	Processing system revision	ontime	42054.51839304	Sum of GTIs [s]
caldsver	4.8.2	 	ontime0	42060.800323606	Sum of GTIs [s]
date	2019-03-06T23:40:35	Date and time of file creation	ontime1	42054.518383026	Sum of GTIs [s]
revision	2	Processing version of data	ontime2	42057.659442782	Sum of GTIs [s]
			ontime3	42054.51839304	Sum of GTIs [s]
			ontime6	42060.800323606	Sum of GTIs [s]
			l1events	1621791	Number of level 1 events

2.1.4 Events

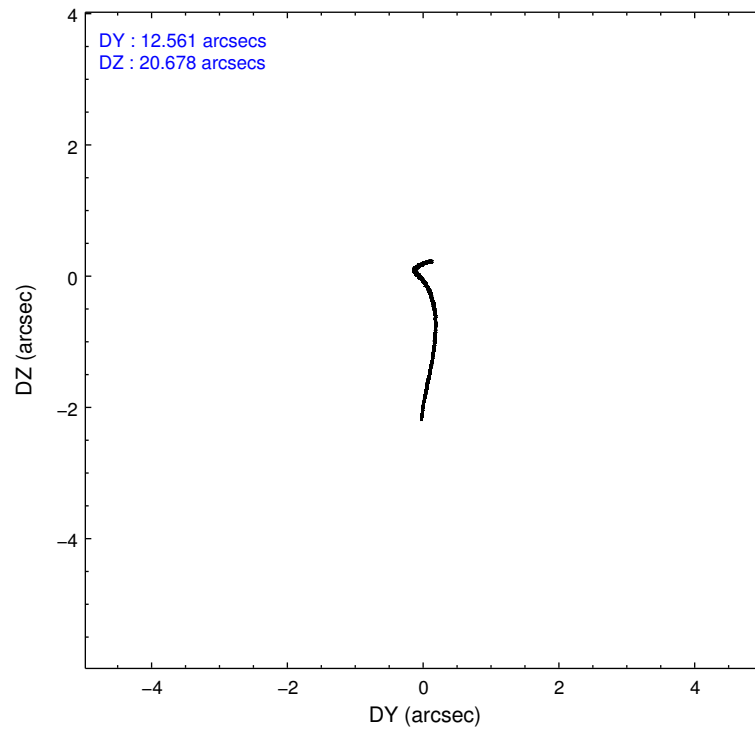
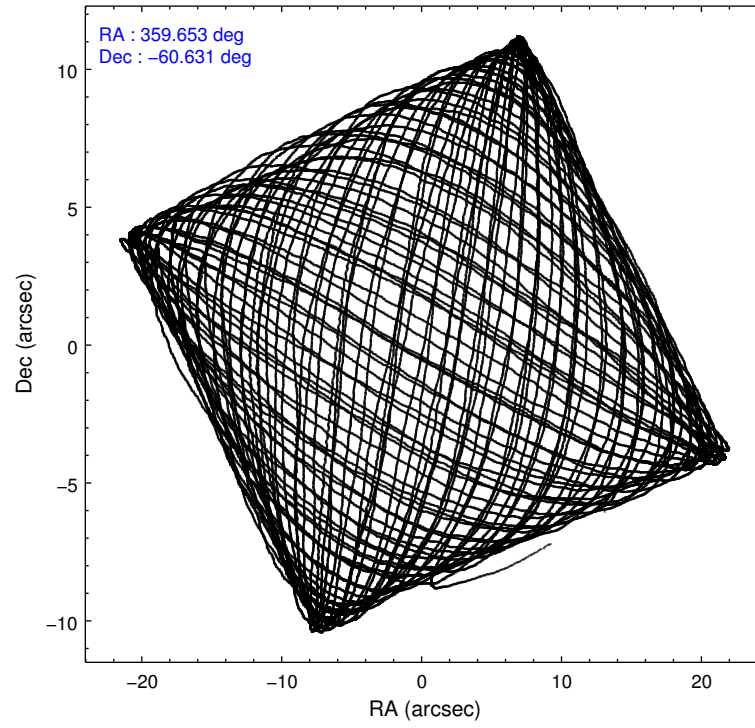
	ccd 0	ccd 1	ccd 2	ccd 3	ccd 6		ccd 0	ccd 1	ccd 2	ccd 3	ccd 6
level 1 events	299561	312095	331410	329798	348927	grade 0 events	13050	17423	14125	19243	26469
rejected events	262598	266519	294370	287315	296791		4%	5%	4%	5%	7%
rejected %	87%	85%	88%	87%	85%	grade 1 events	165	173	205	229	257
							0%	0%	0%	0%	0%
						grade 2 events	9323	11318	8899	8322	9372
							3%	3%	2%	2%	2%
						grade 3 events	3629	3730	3472	3778	3686
							1%	1%	1%	1%	1%
						grade 4 events	3323	3679	3577	3667	3505
							1%	1%	1%	1%	1%
						grade 5 events	13329	13930	12382	15076	14377
							4%	4%	3%	4%	4%
						grade 6 events	7641	9432	6979	7476	9112
							2%	3%	2%	2%	2%
						grade 7 events	249101	252410	281771	272007	282149
							83%	80%	85%	82%	80%

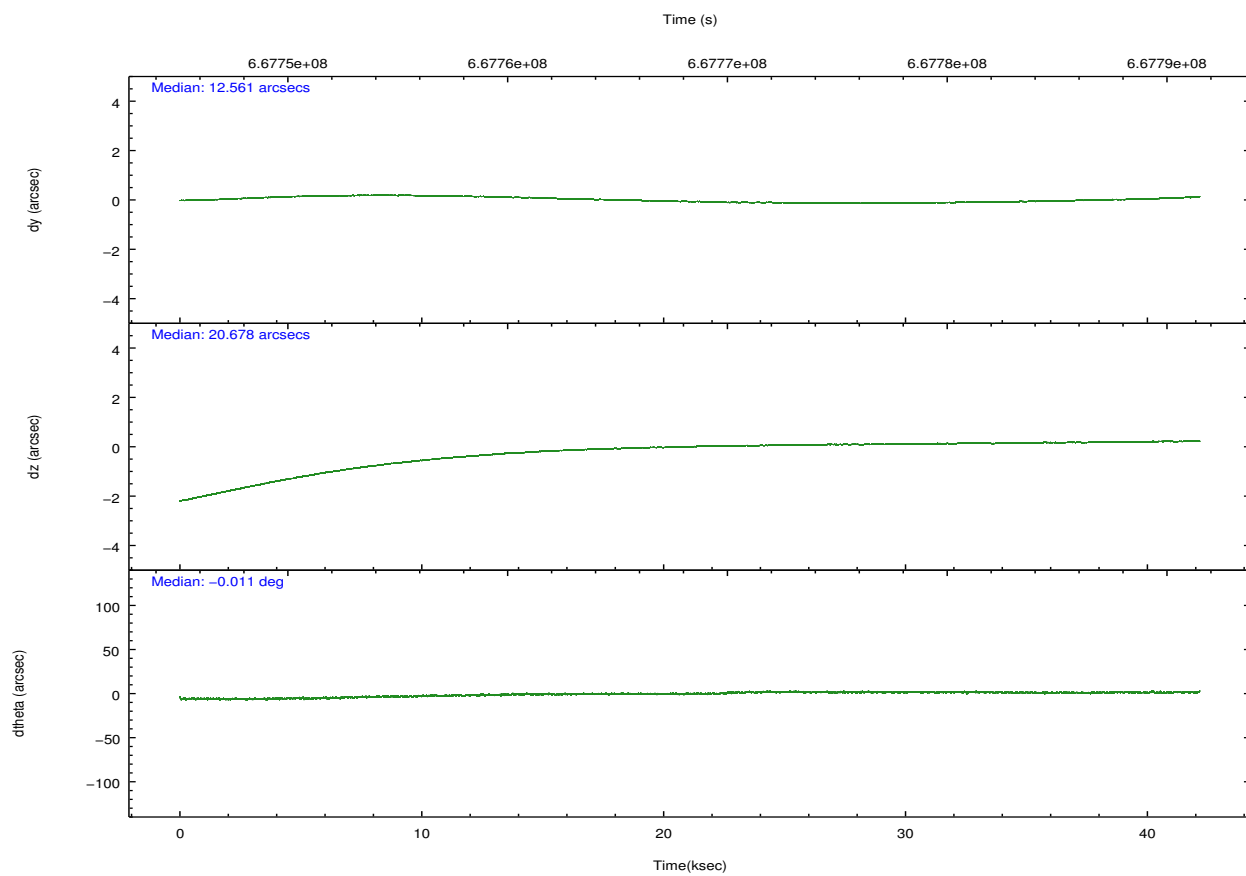
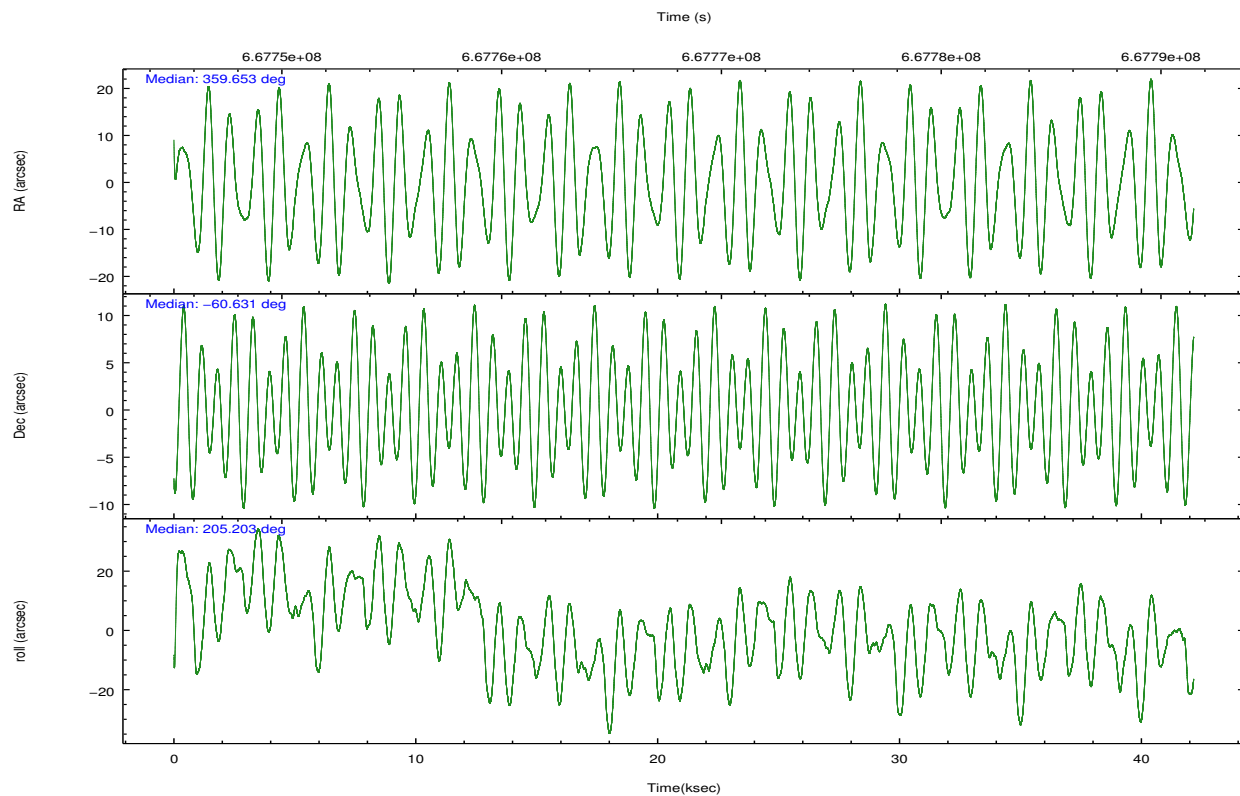
2.2 Compared Parameters

Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-01236	ACIS-01236
Grating	NONE	NONE
Data mode	VFAINT	VFAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	359.684763	359.6528317990781
[deg] Pointing Dec	-60.608413	-60.63115041154901
[deg] Pointing Roll	205.020854	205.2017023830803
[mm] SIM focus pos	-0.782348	-0.7809083437167272
[mm] SIM defocus	0	0.001439871863259334
[mm] SIM translation stage pos	-233.592463	-233.5874344608287
[mm] SIM translation stage offset	0	-0.005018542100998502
[s] Observation start time (MET)	667747374.184000	667746194.3518
Observation start date	2019-02-28T13:21:45	2019-02-28T13:03:14
[s] Observation end time (MET)	667789374.184000	667789744.0419
Observation end date	2019-03-01T01:01:45	2019-03-01T01:09:04
Read mode	TIMED	TIMED

Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	NONE	NONE
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	3.1

2.3 Aspect



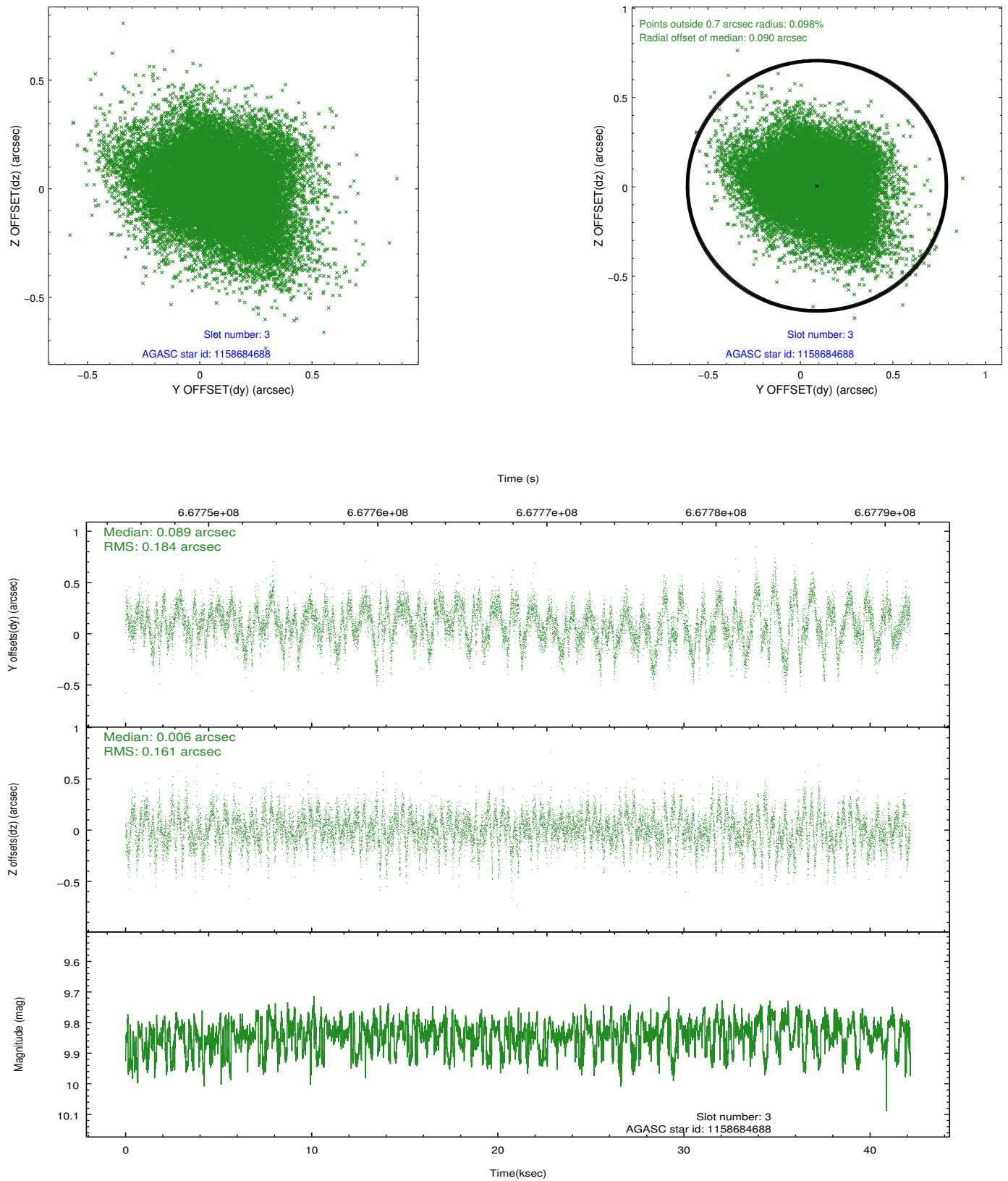


Slot Statistics

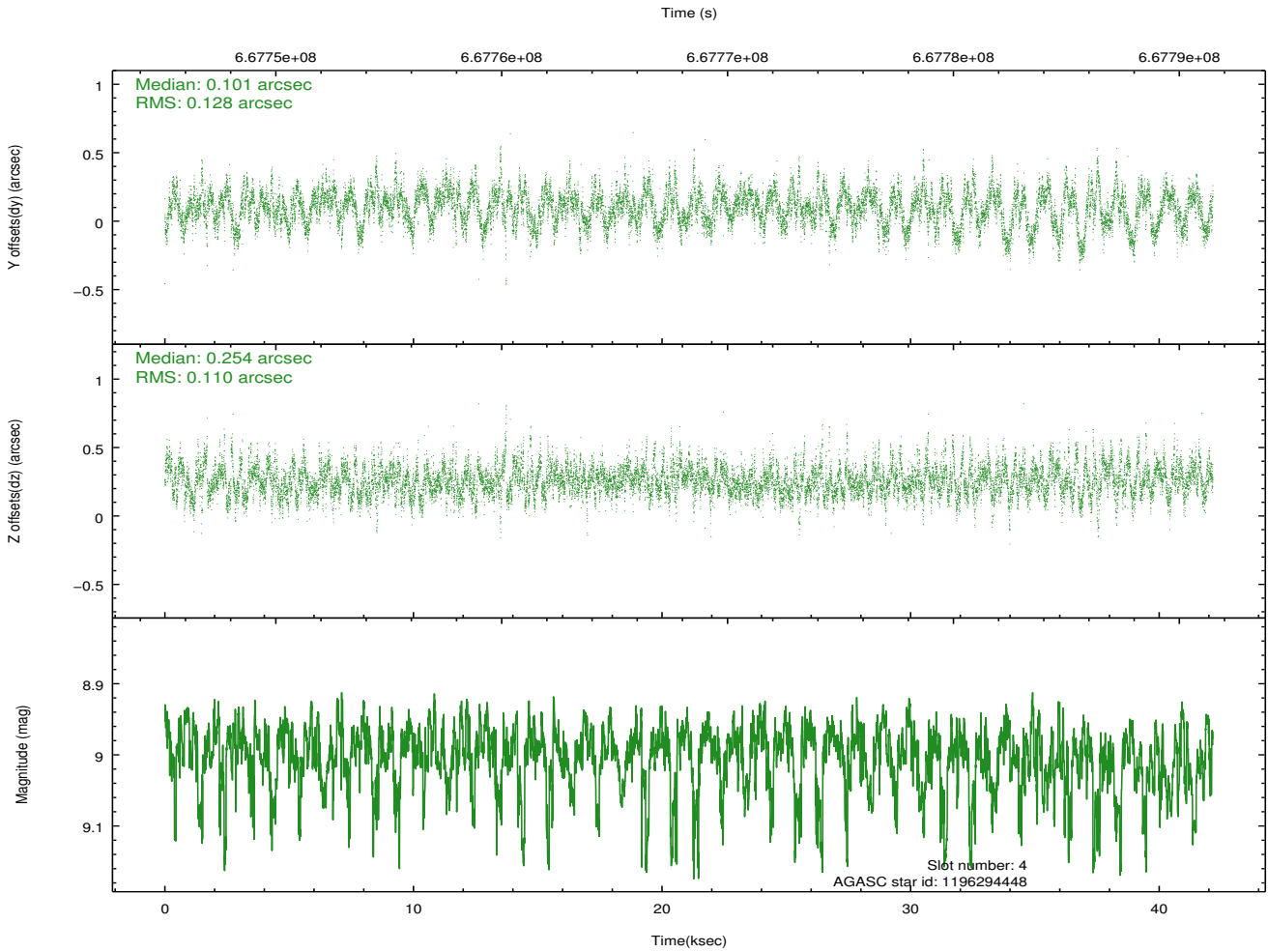
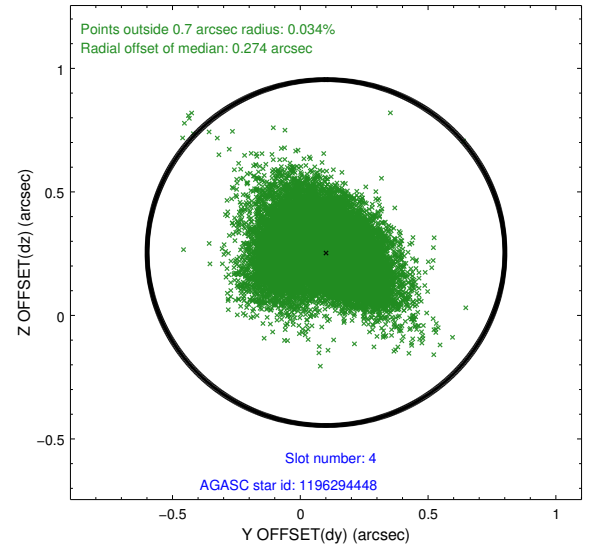
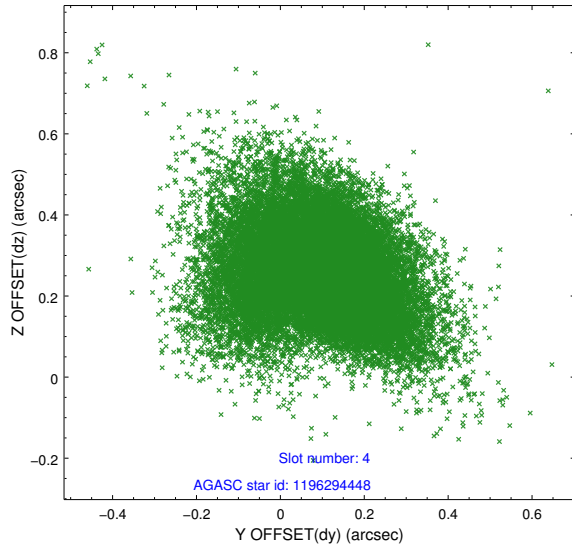
pt	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mea
0	FID		ACIS-I-1	7.22	10283	1.000	0.198	-0.213	0.008	0.014	0.000000	0.000000	927.28	-844
1	FID		ACIS-I-3	7.45	10284	1.000	-0.061	0.175	0.014	0.033	0.000000	0.000000	44.55	-977
2	FID		ACIS-I-5	7.21	10284	1.000	-0.228	0.111	0.011	0.038	0.000000	0.000000	-1821.62	1053
3	GUIDE	used	1158684688	9.84	20504	1.000	0.089	0.006	0.258	0.426	1.119998	-60.745878	-2067.02	1542
4	GUIDE	used	1196294448	9.00	20539	1.000	0.101	0.254	0.176	0.298	358.652774	-60.349341	1274.84	-1607
5	OMITTED			0.00	0	0.000	0.000	0.000	0.000	0.000	0.000000	0.000000	0.00	0
6	OMITTED			0.00	0	0.000	0.000	0.000	0.000	0.000	0.000000	0.000000	0.00	0
7	GUIDE	used	1196299136	8.55	20546	1.000	-0.187	-0.253	0.132	0.222	358.918581	-60.979672	1780.72	652

2.4 Star Slots

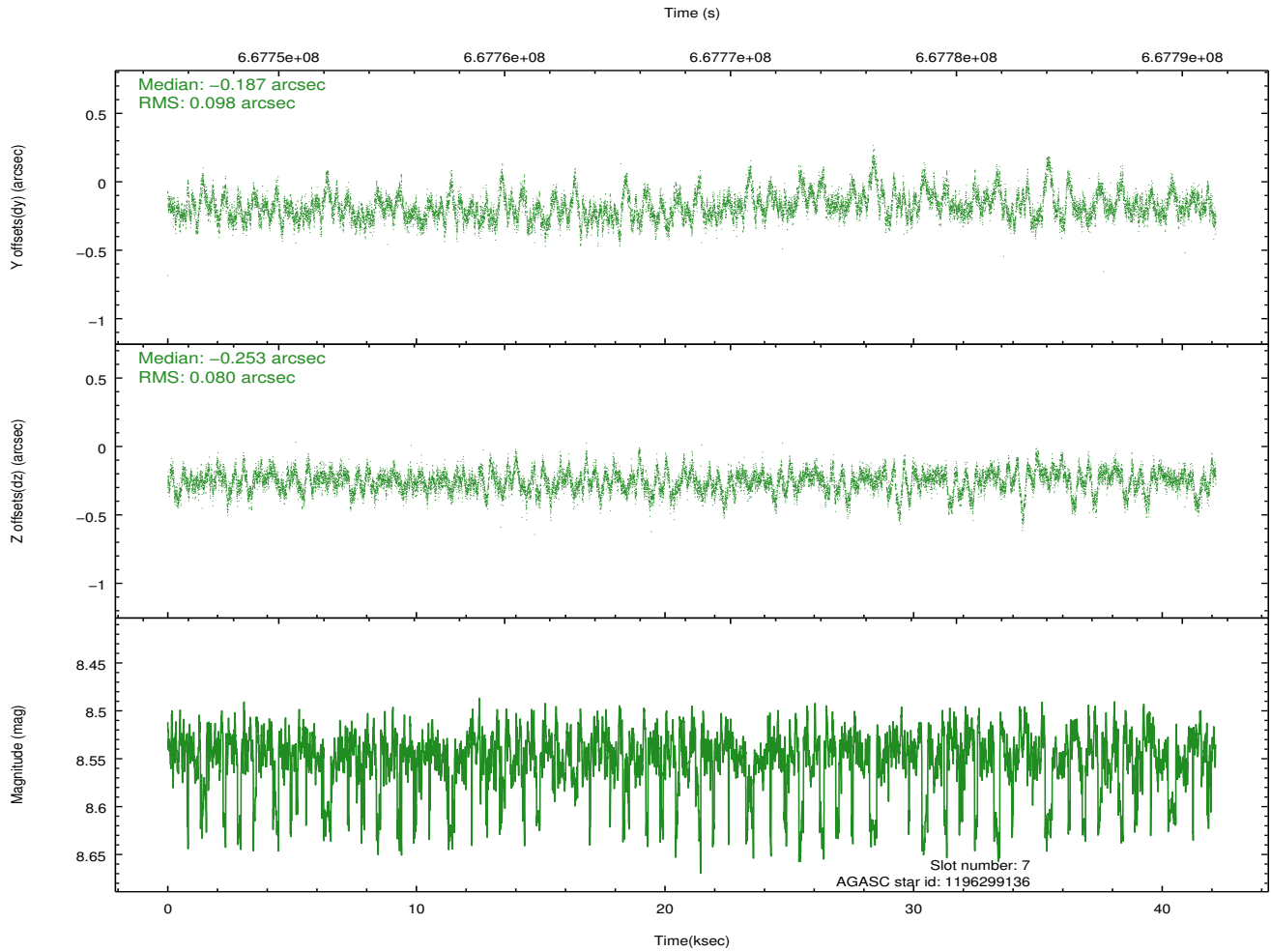
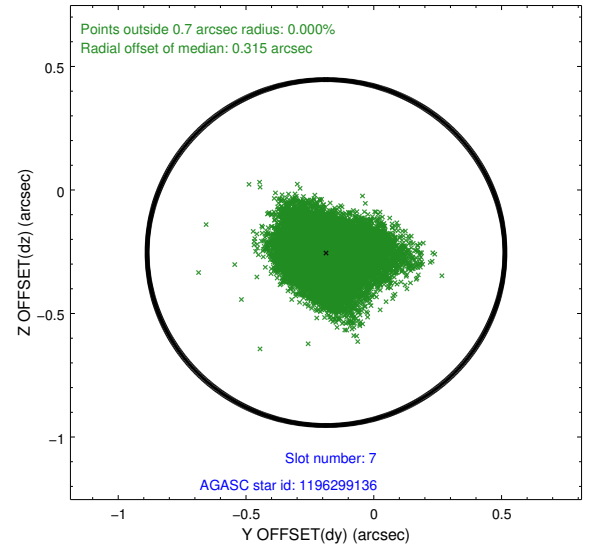
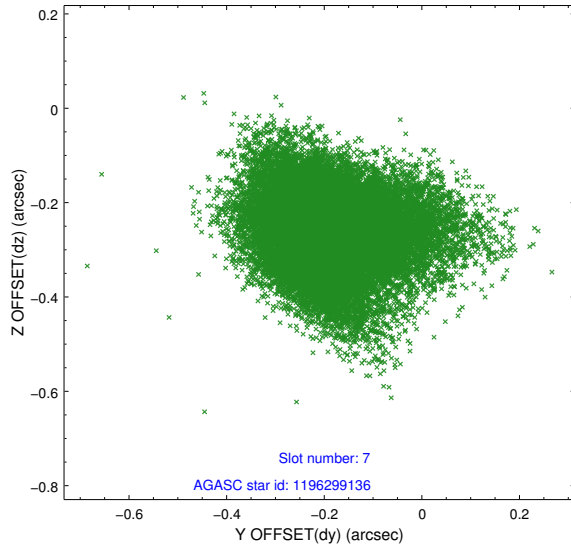
2.4.1 Slot 3



2.4.2 Slot 4

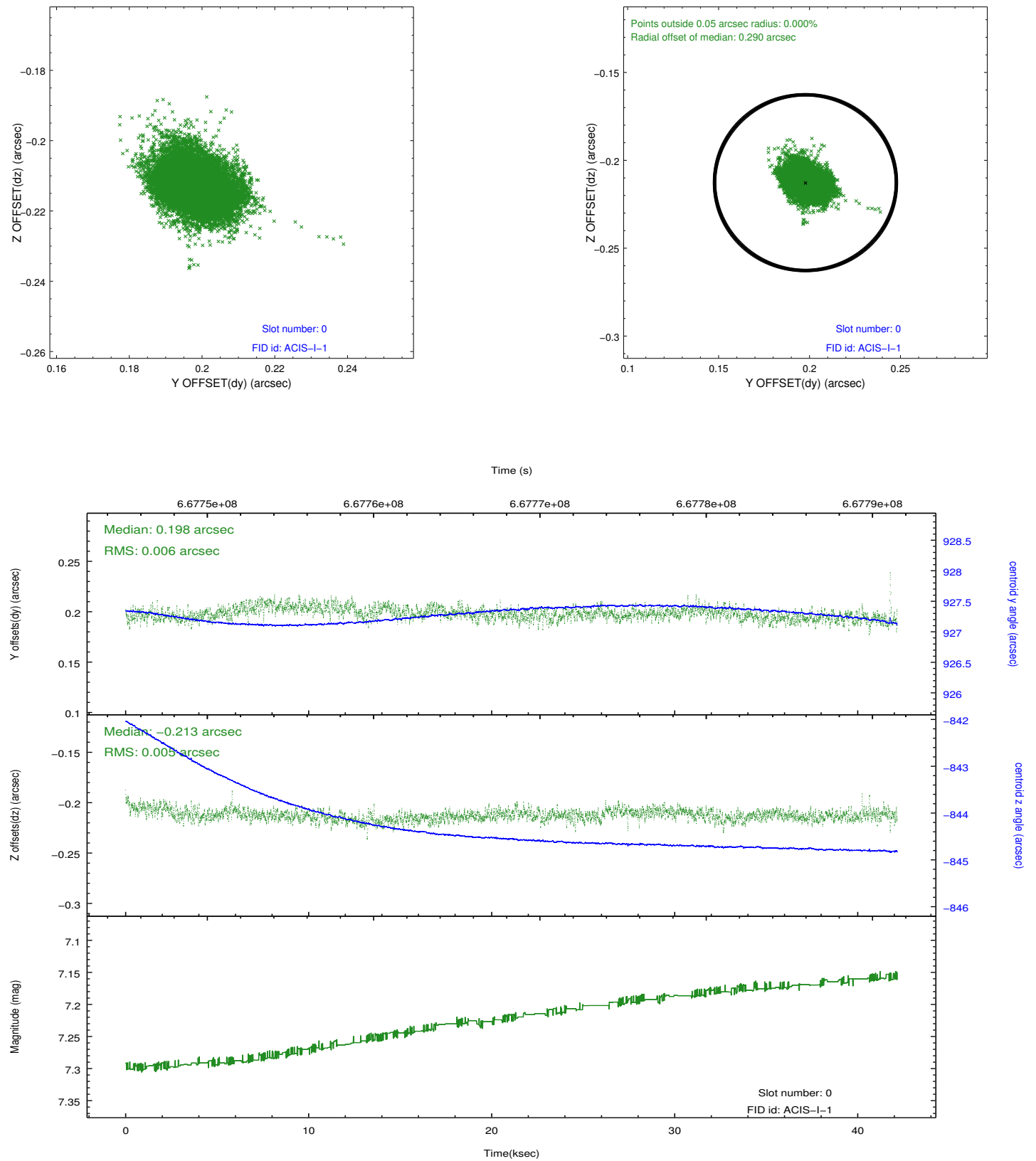


2.4.3 Slot 7

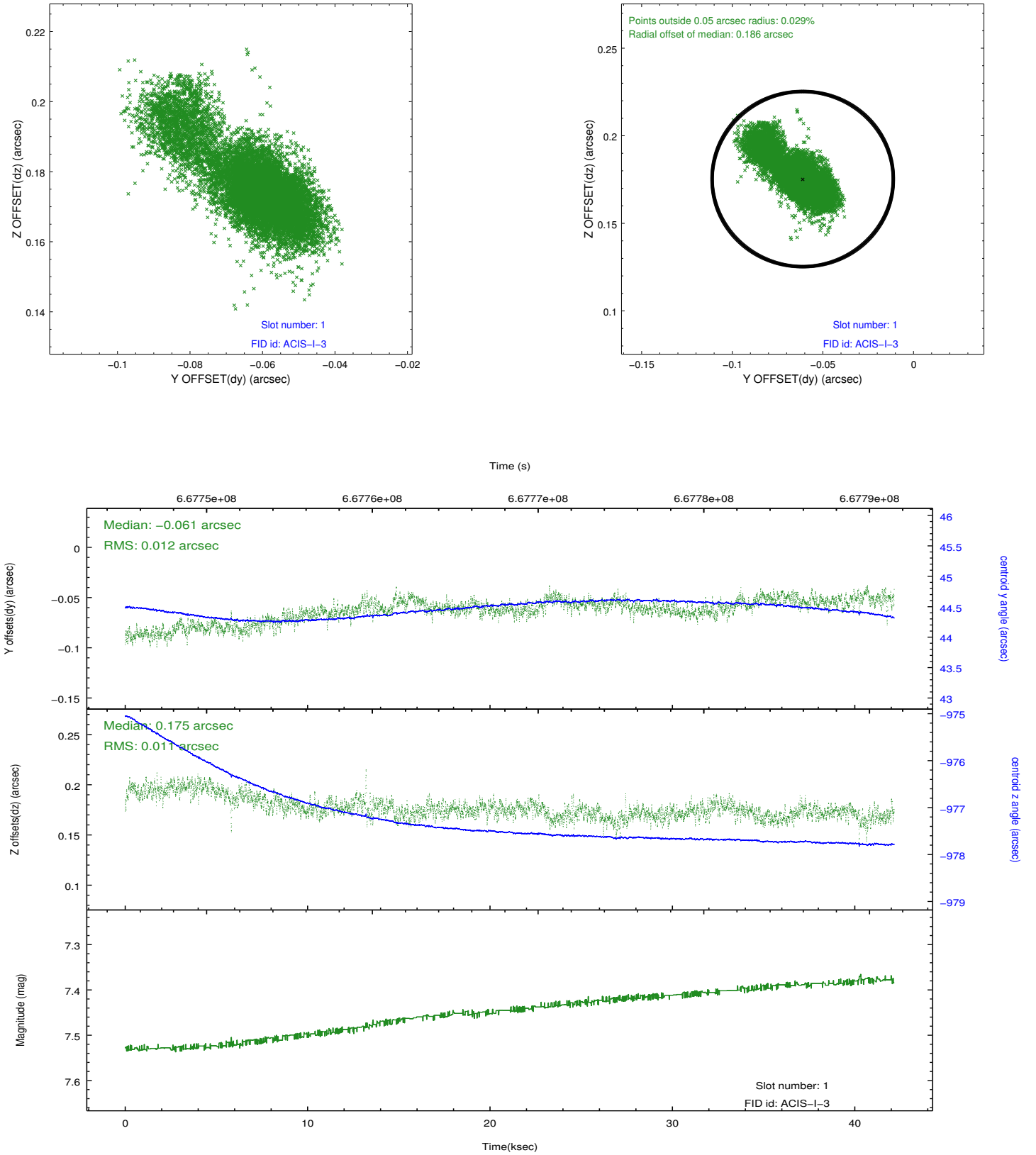


2.5 FID Slots

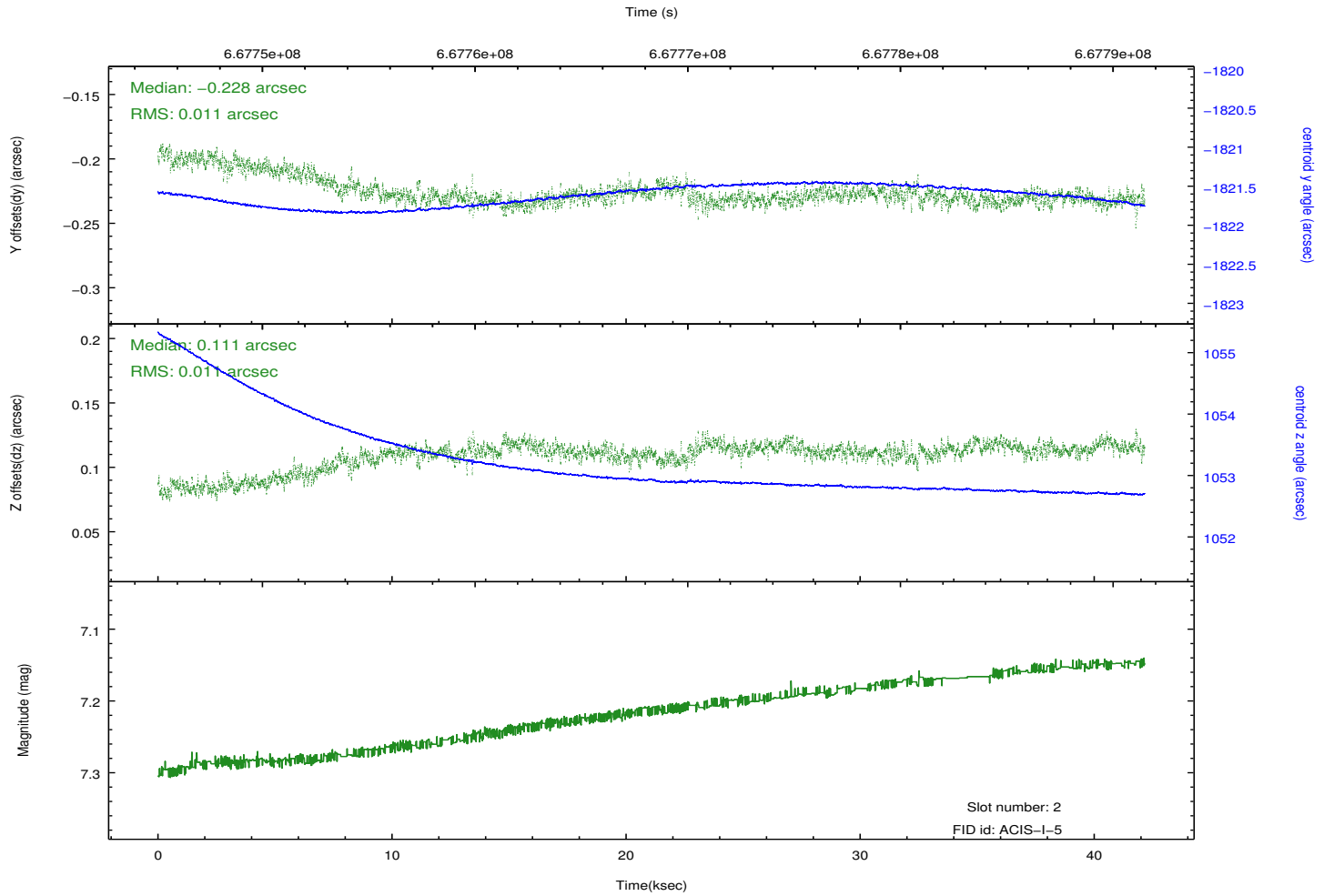
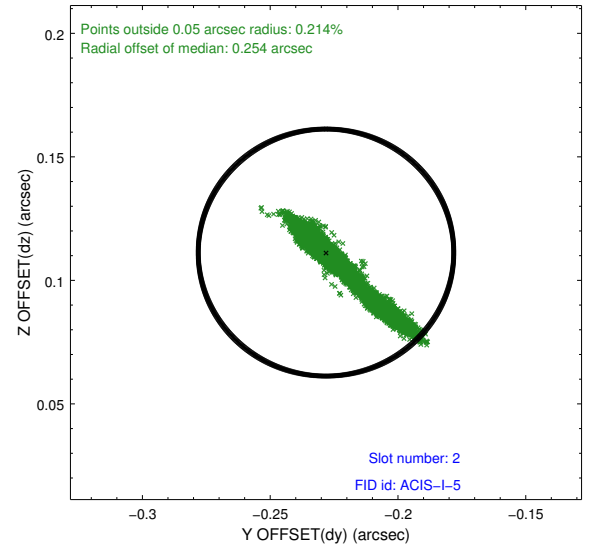
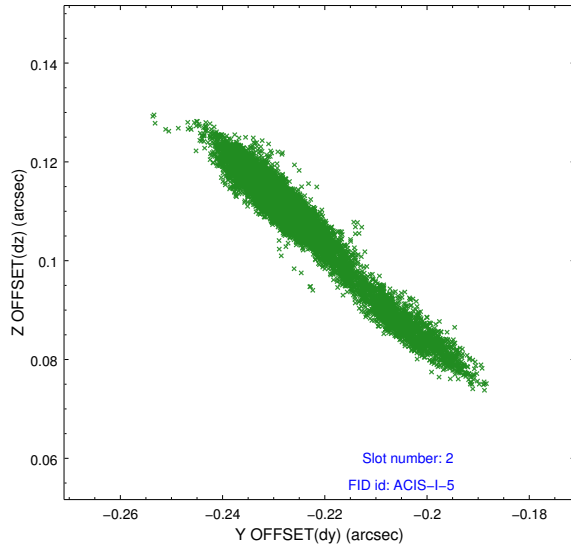
2.5.1 Slot 0



2.5.2 Slot 1



2.5.3 Slot 2



A Summary

A.1 Status

V&V Scientist	Jen Lauer
V&V Date (YYYY-MM-DD)	2019.03.07
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	42.05451839304

A.2 Comments

The guide stars in slot 5 and 6 were removed from the aspect solution due to poor data quality. The aspect solution is improved by the removal of these guide stars from the solution.

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The focal plane temperature during part of this observation 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.