

V&V Reference Report

L2 ASCDS Version : 10.7.1

Observation 21647 - L2 Version 1
Chandra X-Ray Center

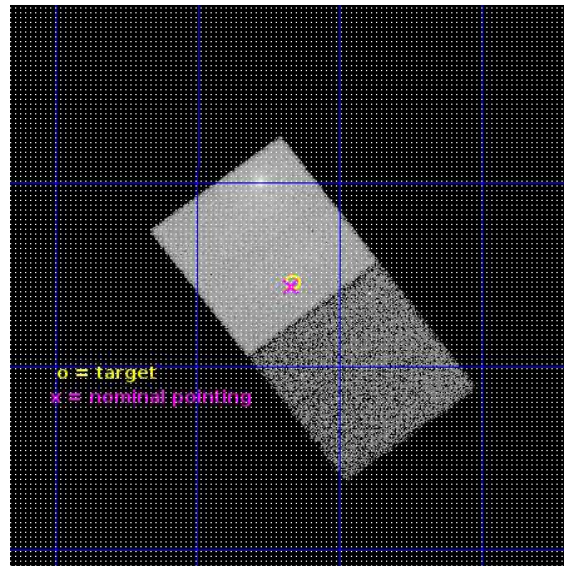
L2 Processing Date : Apr 17 2019

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1 Front

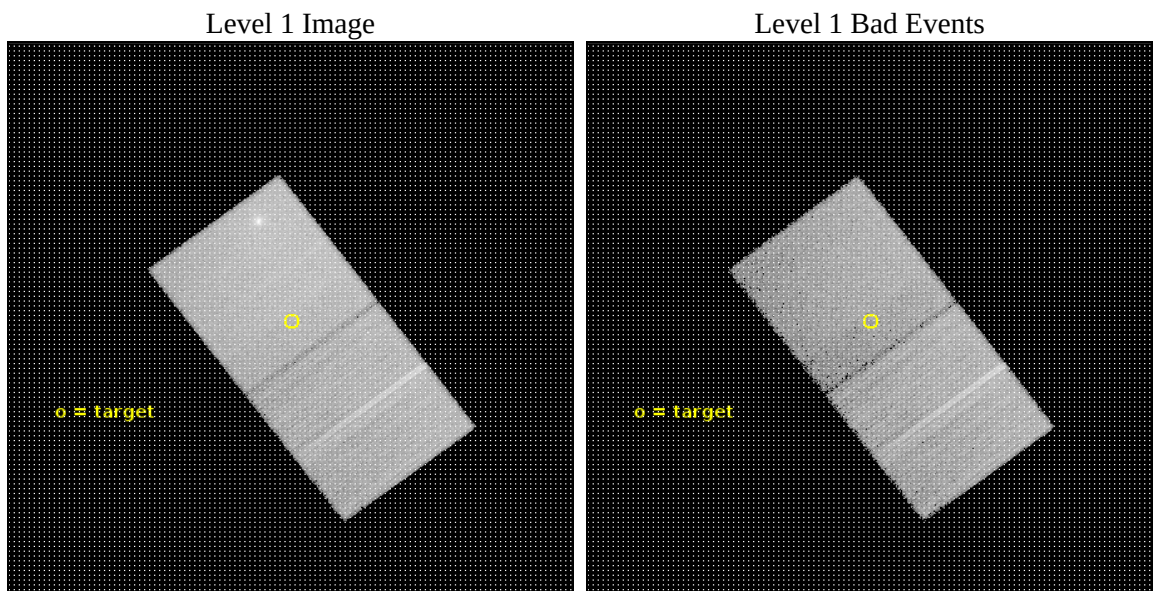
seq_num	601444	Sequence number
obs_id	21647	Observation id
title	The Nature of the Two Globular Cluster ULXs in the Galaxy NGC 4472	
observer	Stephen Zepf	Principal investigator
object	NGC 4472 ULXs	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	187.415417	Observer's specified target RA [deg]
dec_targ	7.909167	Observer's specified target Dec [deg]
ra_nom	187.41718348865	Nominal RA [deg]
dec_nom	7.905666444888	Nominal Dec [deg]
roll_nom	233.15641334656	Nominal Roll [deg]
revision	1	Processing version of data
ontime	30081.0	Sum of GTIs [s]
livetime	29675.045379212	Livetime [s]
ontime6	30081.0	Sum of GTIs [s]
ontime7	30081.0	Sum of GTIs [s]
l2events	174068	Number of level 2 events



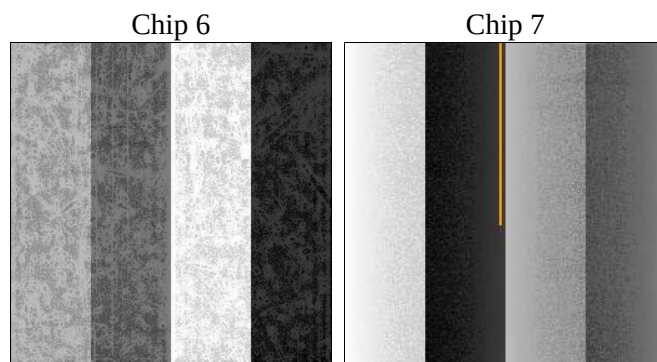
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	30000.000000	[s] Scheduled observation exposure time
ascdsver	10.7.1	Processing system revision	ontime	30081.0	Sum of GTIs [s]
caldsver	4.8.2	 	ontime6	30081.0	Sum of GTIs [s]
date	2019-04-18T01:26:55	Date and time of file creation	ontime7	30081.0	Sum of GTIs [s]
revision	1	Processing version of data	l1events	577255	Number of level 1 events

2.1.4 Events

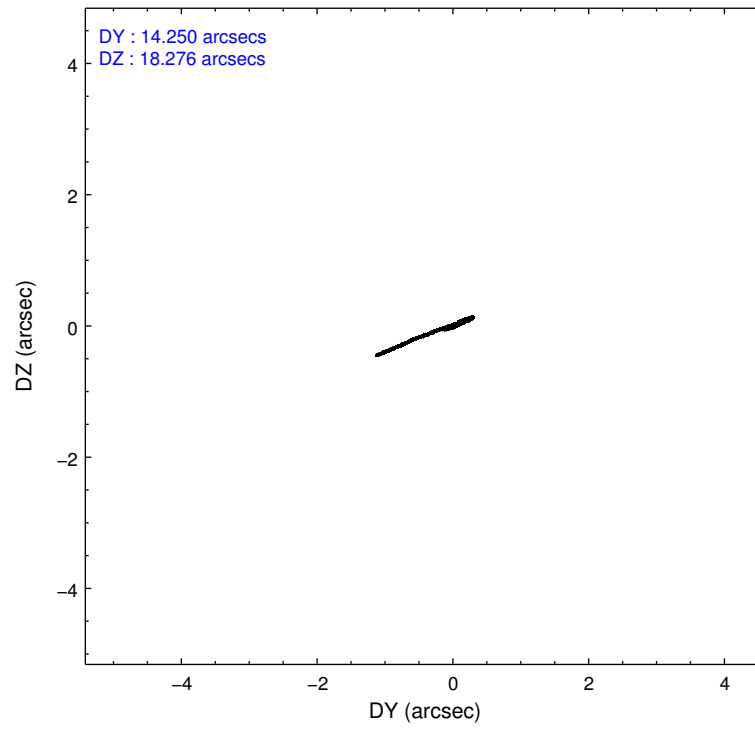
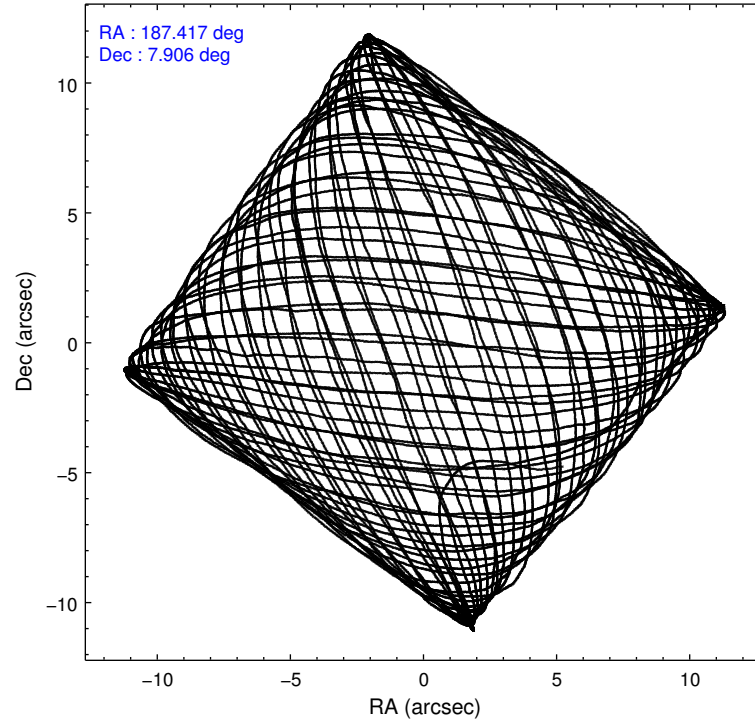
	ccd 6	ccd 7
level 1 events	254728	322527
rejected events	226093	169958
rejected %	88%	52%

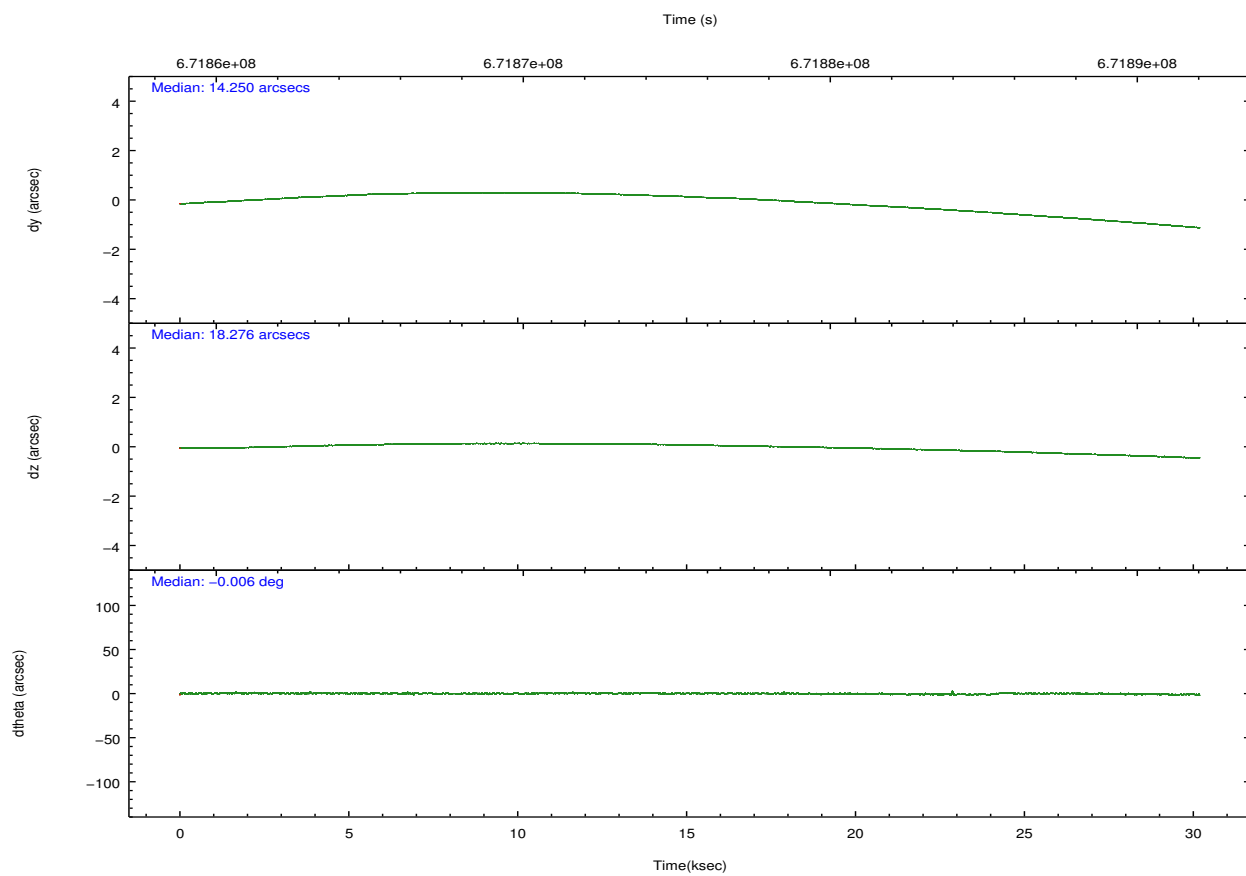
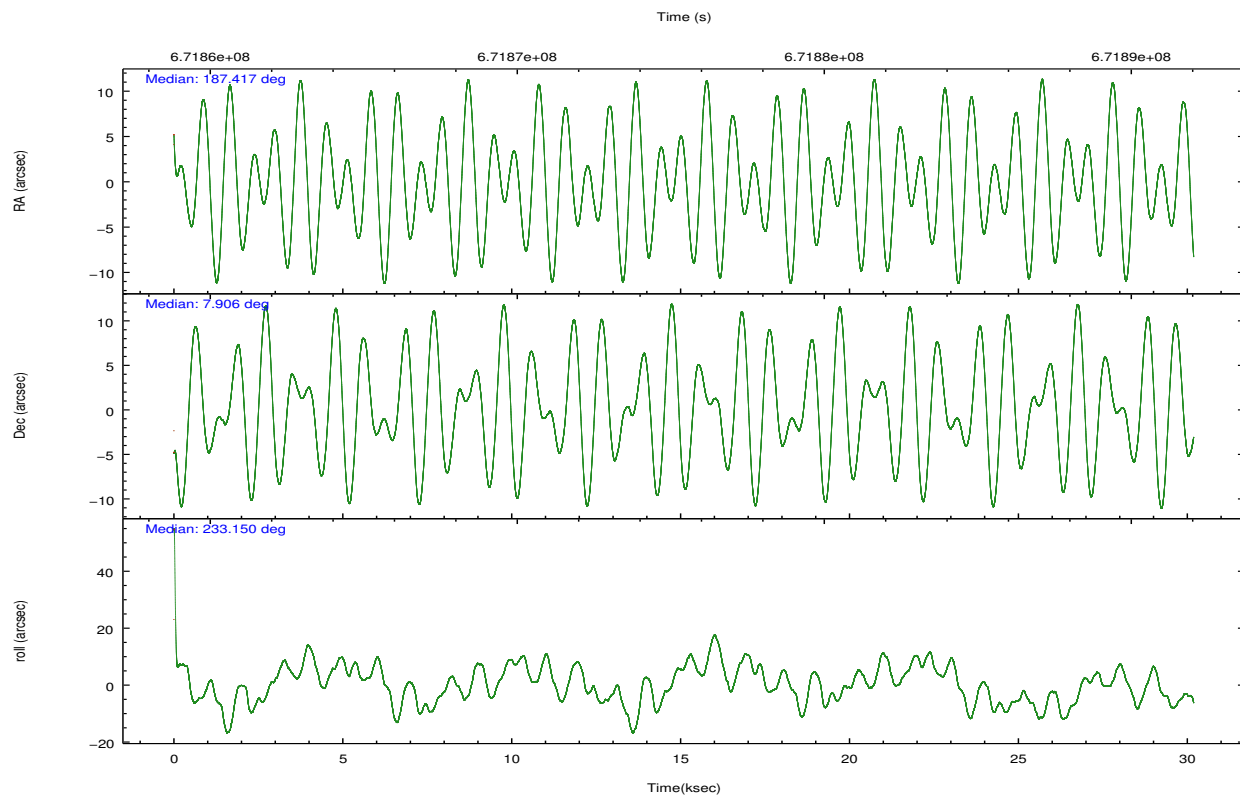
	ccd 6	ccd 7
grade 0 events	9006	17816
	3%	5%
grade 1 events	108	470
	0%	0%
grade 2 events	7887	33194
	3%	10%
grade 3 events	2148	12906
	0%	4%
grade 4 events	2104	12479
	0%	3%
grade 5 events	9164	28266
	3%	8%
grade 6 events	7491	76190
	2%	23%
grade 7 events	216820	141206
	85%	43%

2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-67	ACIS-67	Obspar file type	PREDICTED	ACTUAL
Grating	NONE	NONE	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	187.420113	187.4171834886493	CCD I2 on	N	N
[deg] Pointing Dec	7.932979	7.905666444887972	CCD I3 on	O1	N
[deg] Pointing Roll	232.999356	233.1564133465631	CCD S0 on	N	N
[mm] SIM focus pos	-0.684267	-0.6828225247311905	CCD S1 on	N	N
[mm] SIM defocus	0	0.001444936568705701	CCD S2 on	Y	Y
[mm] SIM translation stage pos	-190.132523	-190.1425803651734	CCD S3 on	Y	Y
[mm] SIM translation stage offset	0	0.01005778216563158	CCD S4 on	O2	N
[s] Observation start time (MET)	671860529.184000	671859561.11035	CCD S5 on	N	N
Observation start date	2019-04-17T03:54:20	2019-04-17T03:39:21	Number of optional ACIS chips dropped	2	2
[s] Observation end time (MET)	671890529.184000	671891716.38728	On-chip summing requested	N	N
Observation end date	2019-04-17T12:14:20	2019-04-17T12:35:16	Subarray requested	NONE	NONE
Read mode	TIMED	TIMED	Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	3

2.3 Aspect



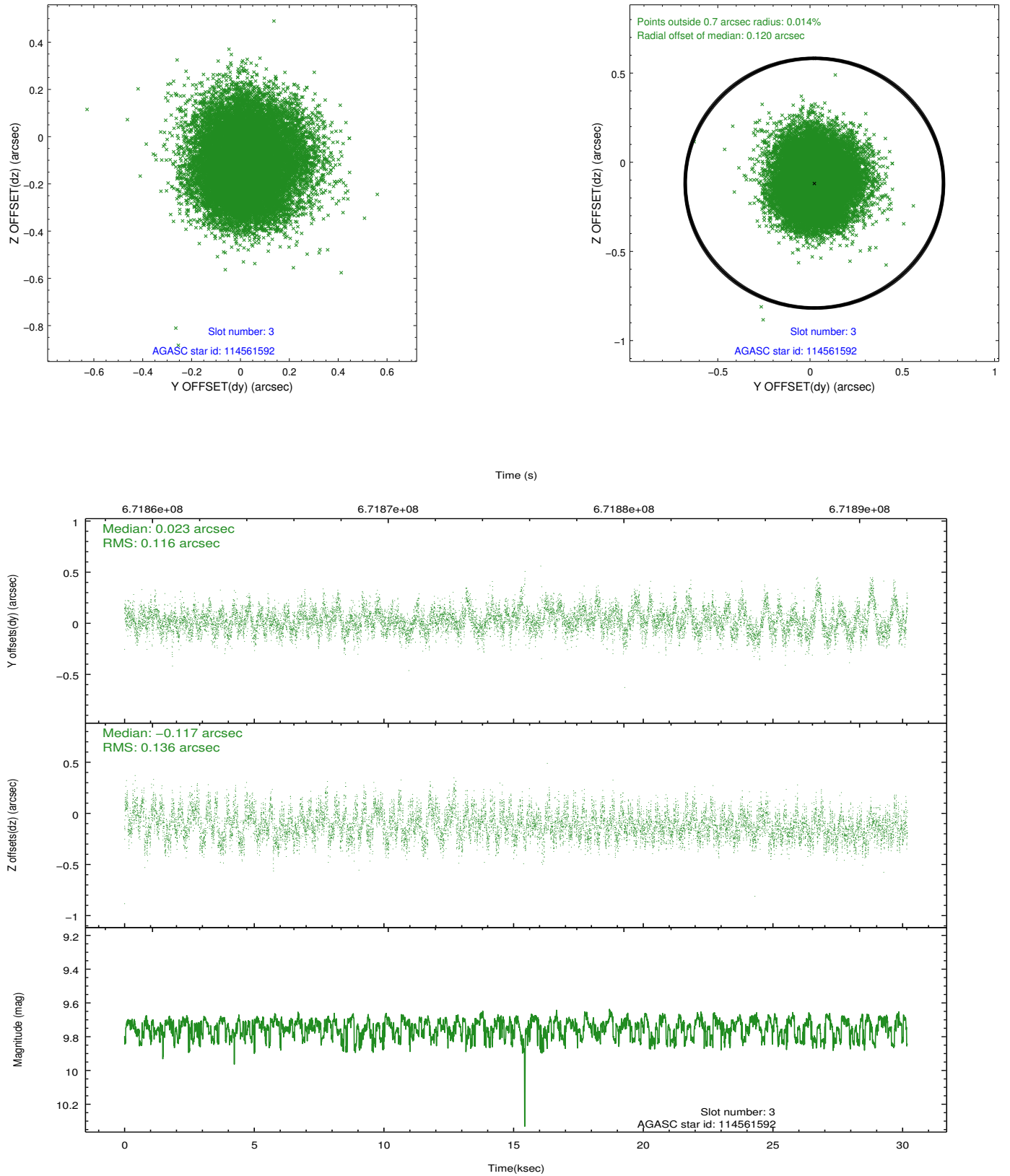


Slot Statistics

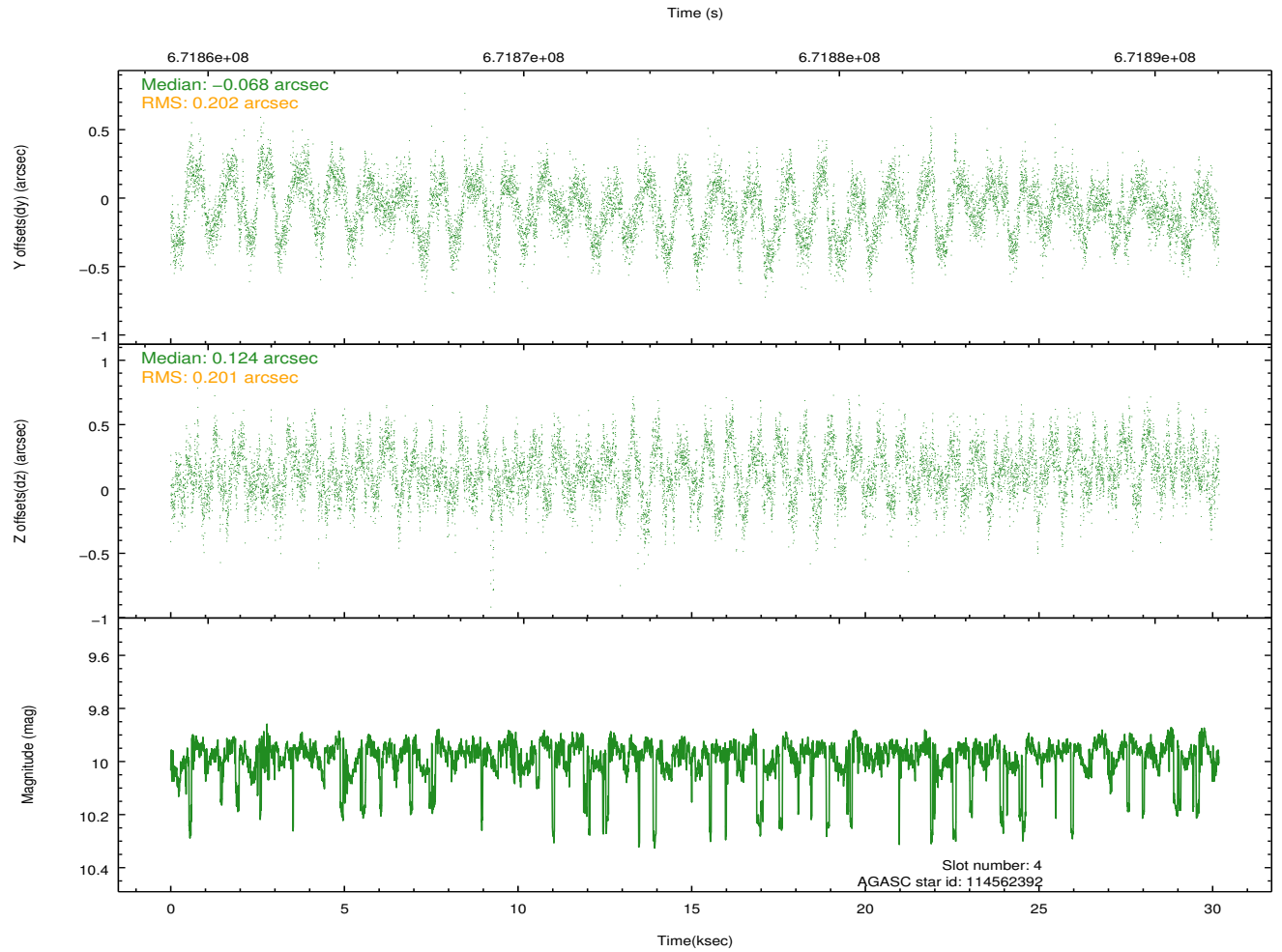
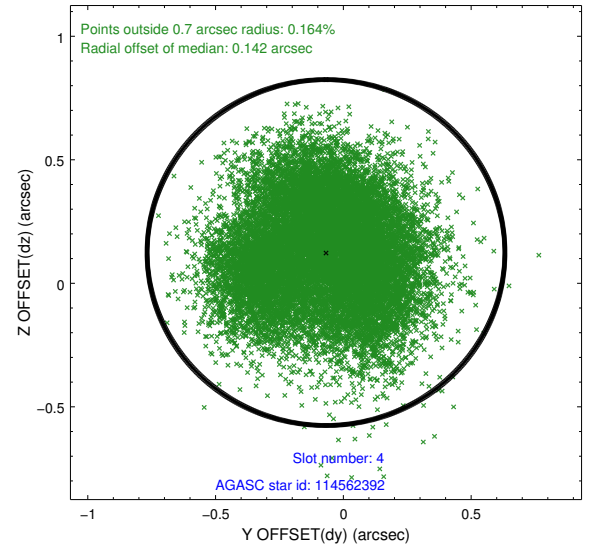
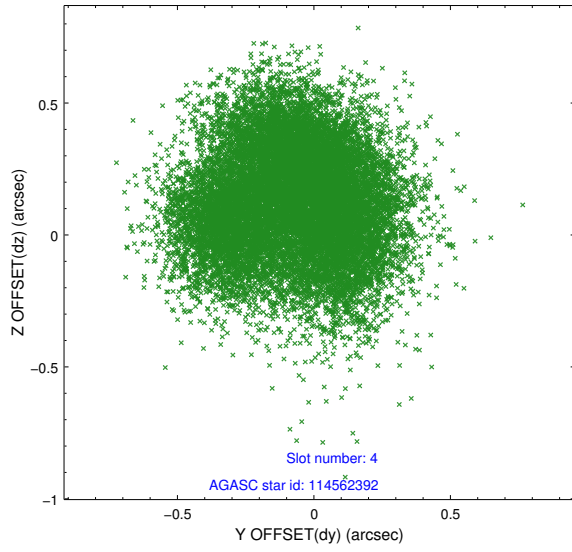
pt	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mea
0	FID		ACIS-S-2	7.17	7363	1.000	-0.292	-0.240	0.017	0.053	0.000000	0.000000	-767.29	-1739
1	FID		ACIS-S-4	7.28	7364	1.000	0.792	0.205	0.015	0.032	0.000000	0.000000	2146.96	169
2	FID		ACIS-S-5	7.26	7363	1.000	-0.531	0.043	0.020	0.046	0.000000	0.000000	-1820.35	162
3	GUIDE	used	114561592	9.75	14630	1.000	0.023	-0.117	0.193	0.300	187.709505	8.445382	-2092.85	-287
4	GUIDE	used	114562392	9.98	14656	1.000	-0.068	0.124	0.310	0.468	187.662769	8.522526	-2214.53	-587
5	GUIDE	used	114563576	7.86	14722	1.000	0.076	0.025	0.210	0.299	186.867039	8.012388	959.20	-1747
6	GUIDE	used	114563648	9.74	14602	1.000	-0.015	-0.041	0.210	0.345	187.009208	7.938475	866.18	-1182
7	OMITTED			0.00	0	0.000	0.000	0.000	0.000	0.000	0.000000	0.000000	0.00	0

2.4 Star Slots

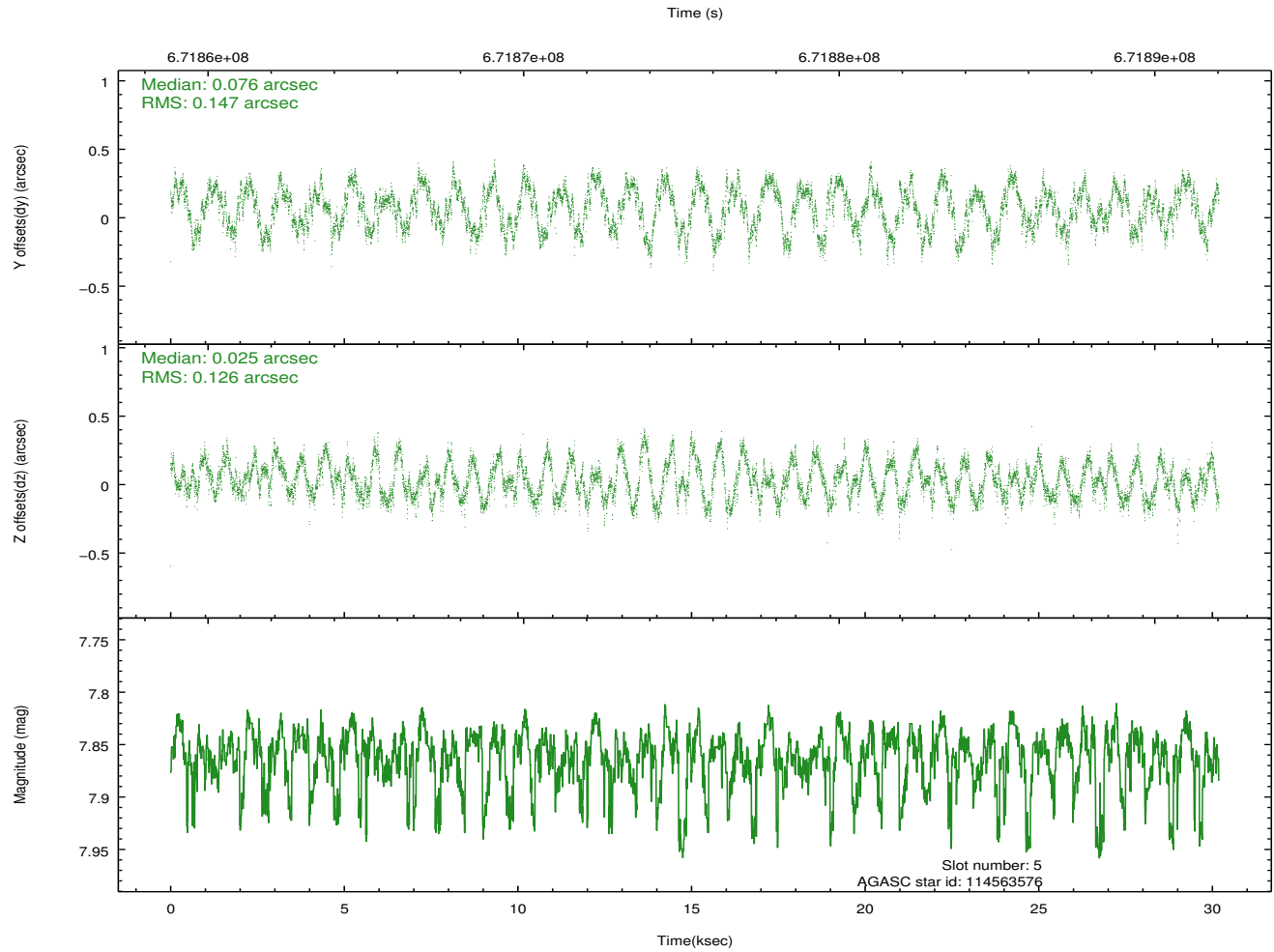
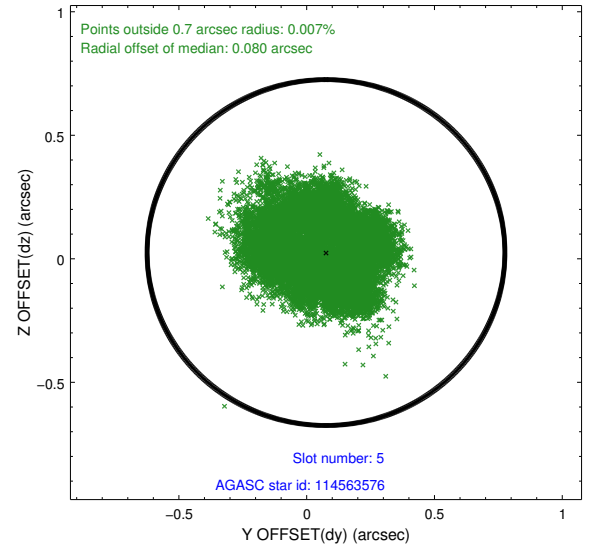
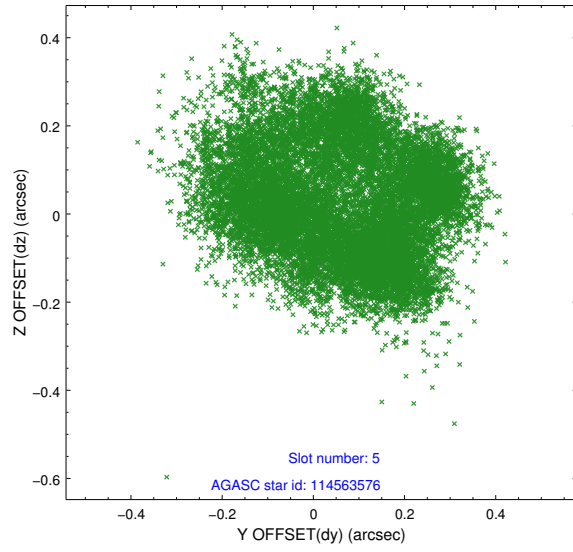
2.4.1 Slot 3



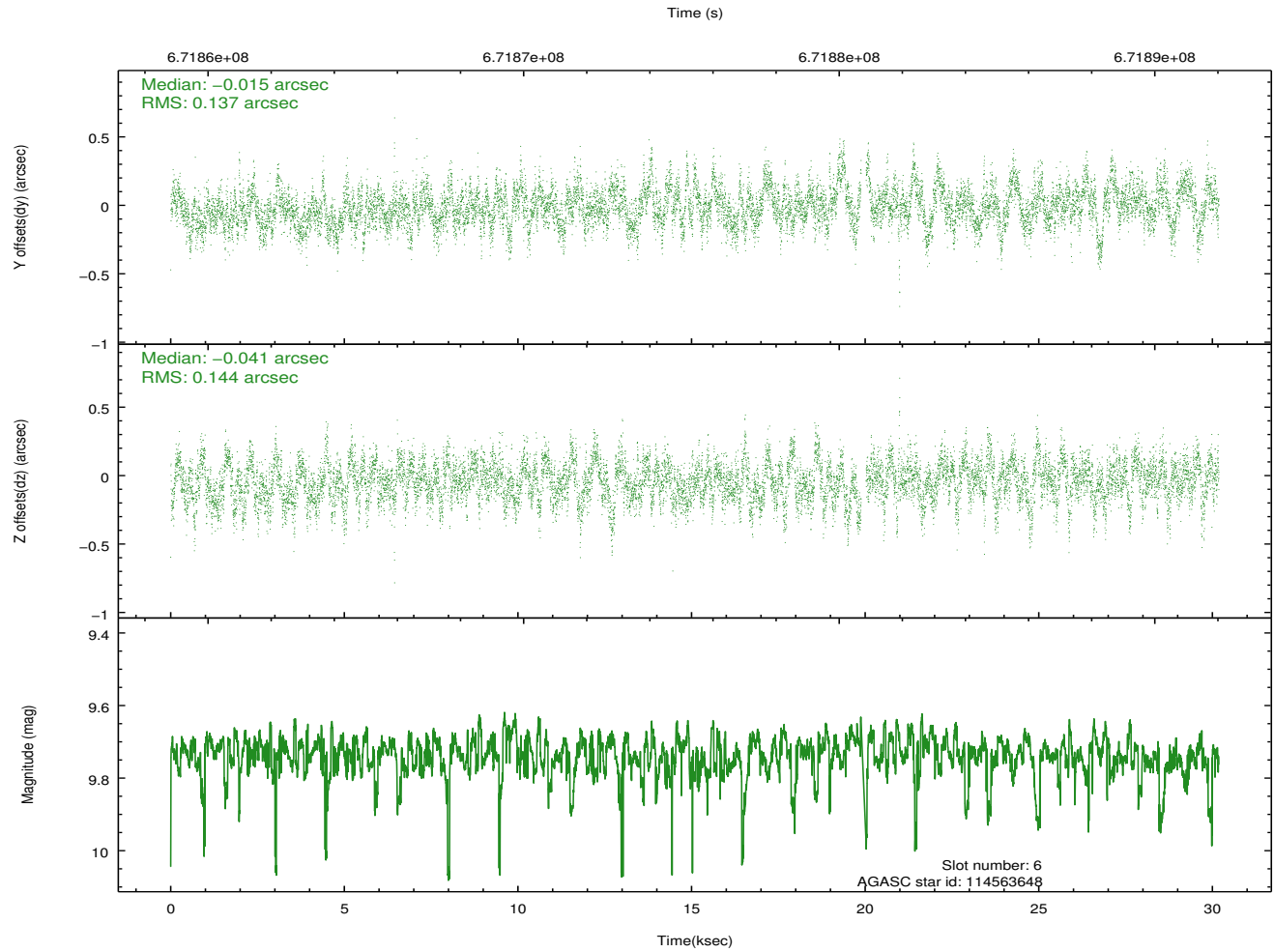
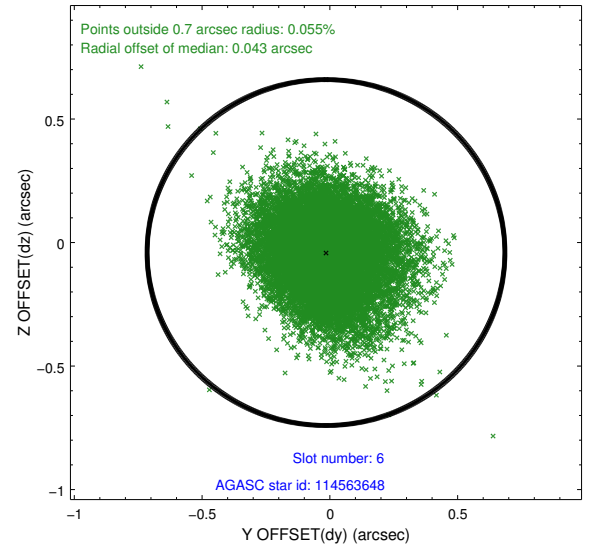
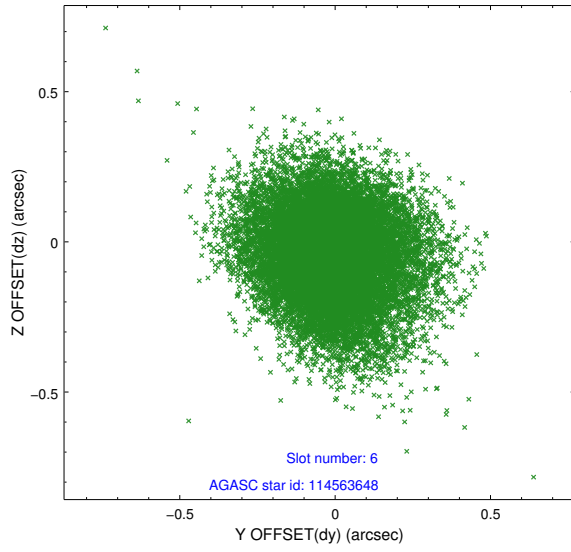
2.4.2 Slot 4



2.4.3 Slot 5

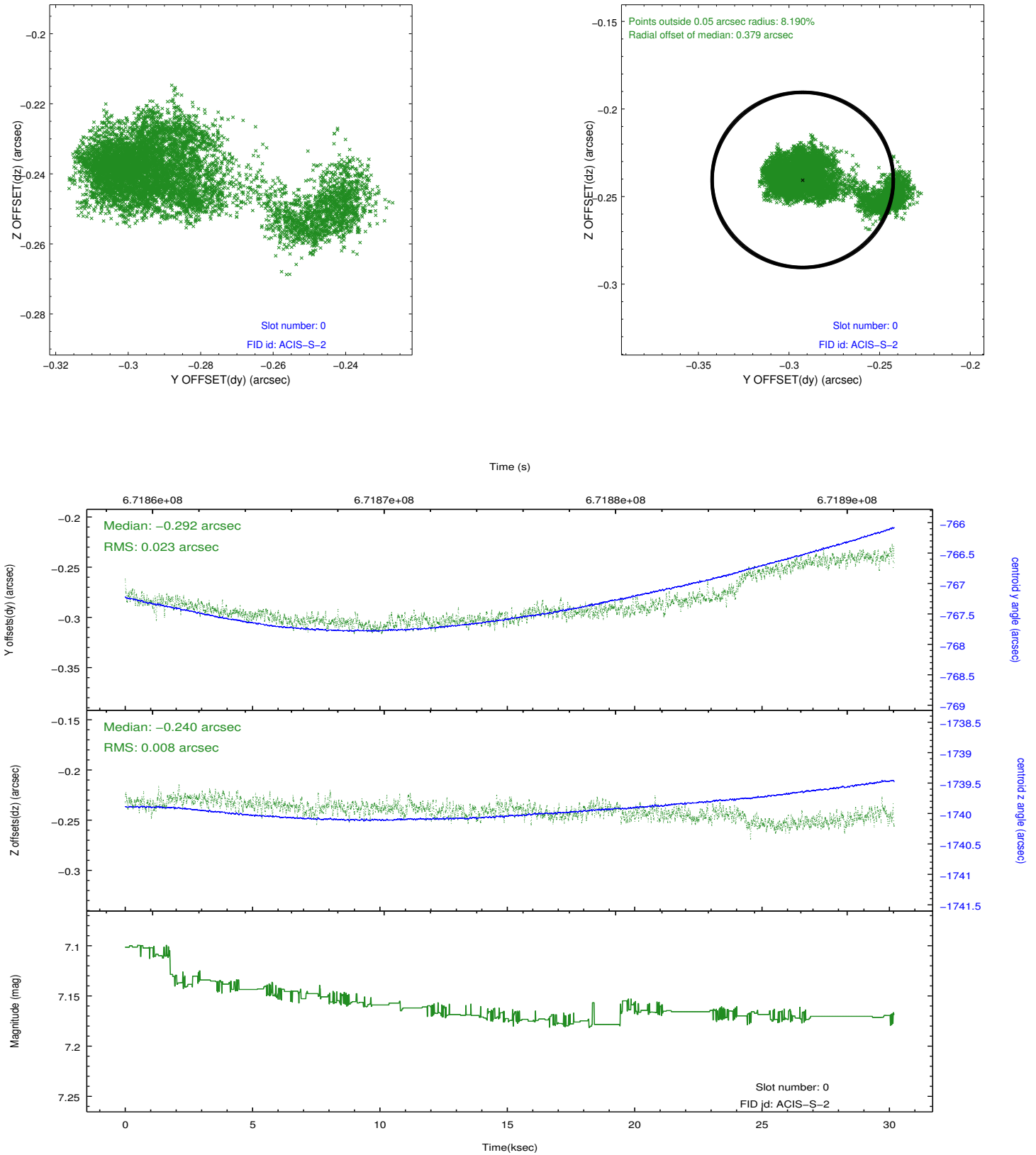


2.4.4 Slot 6

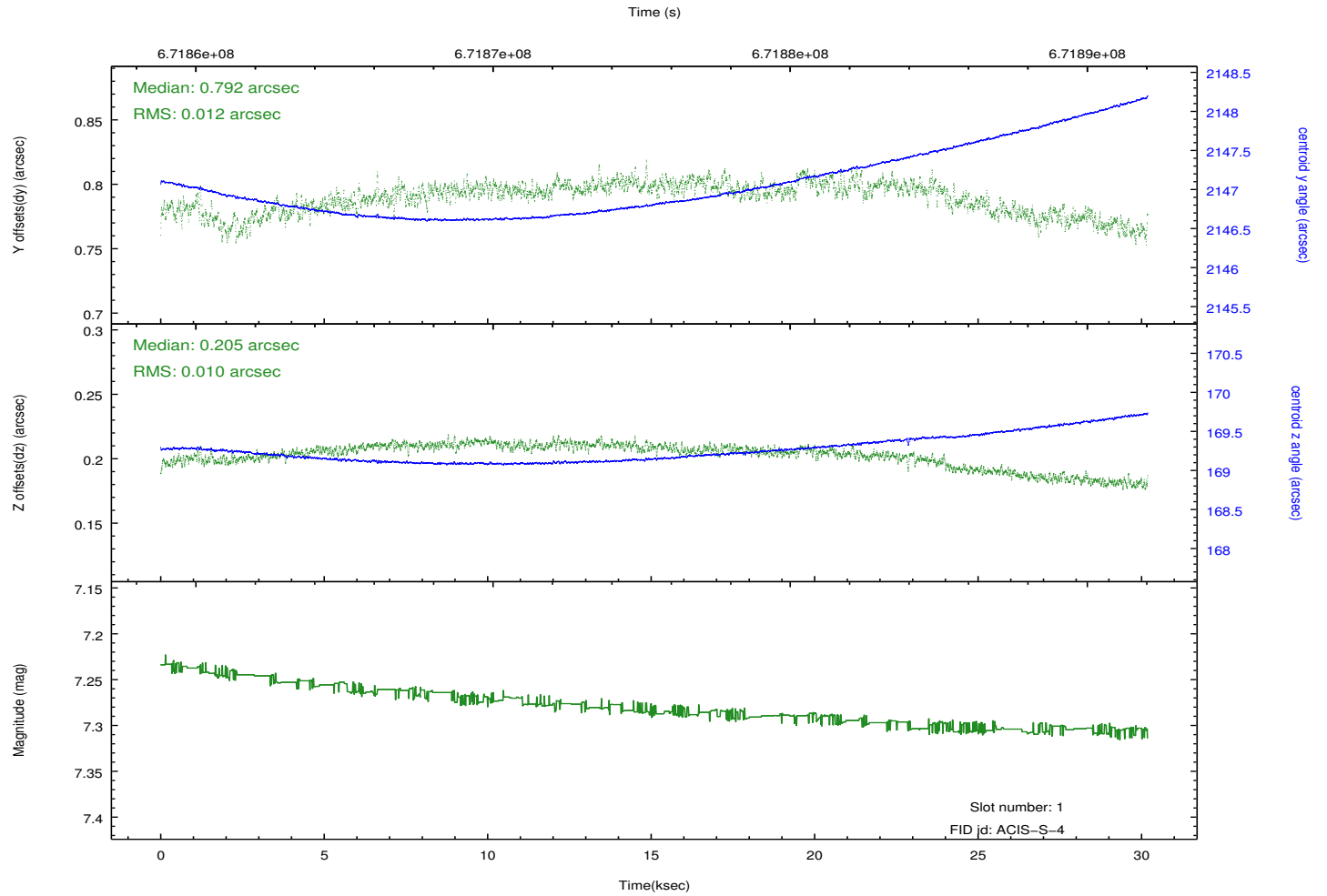
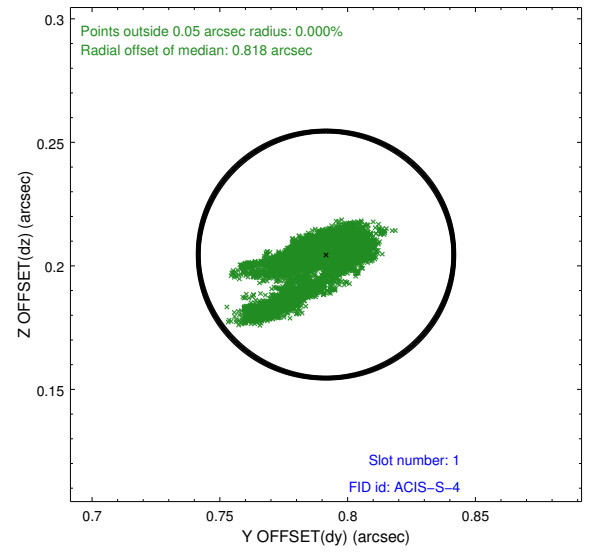
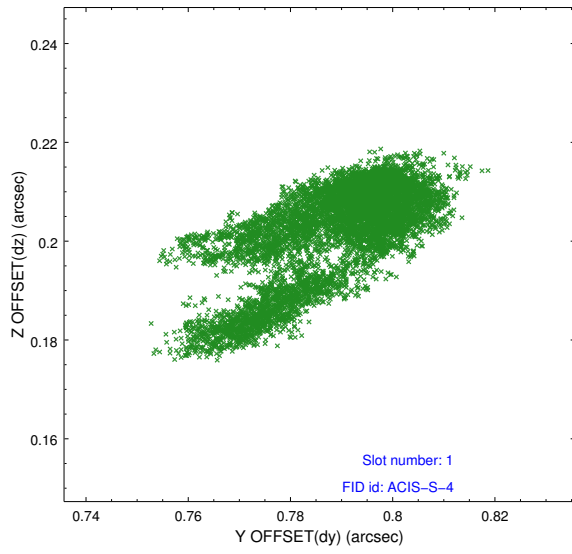


2.5 FID Slots

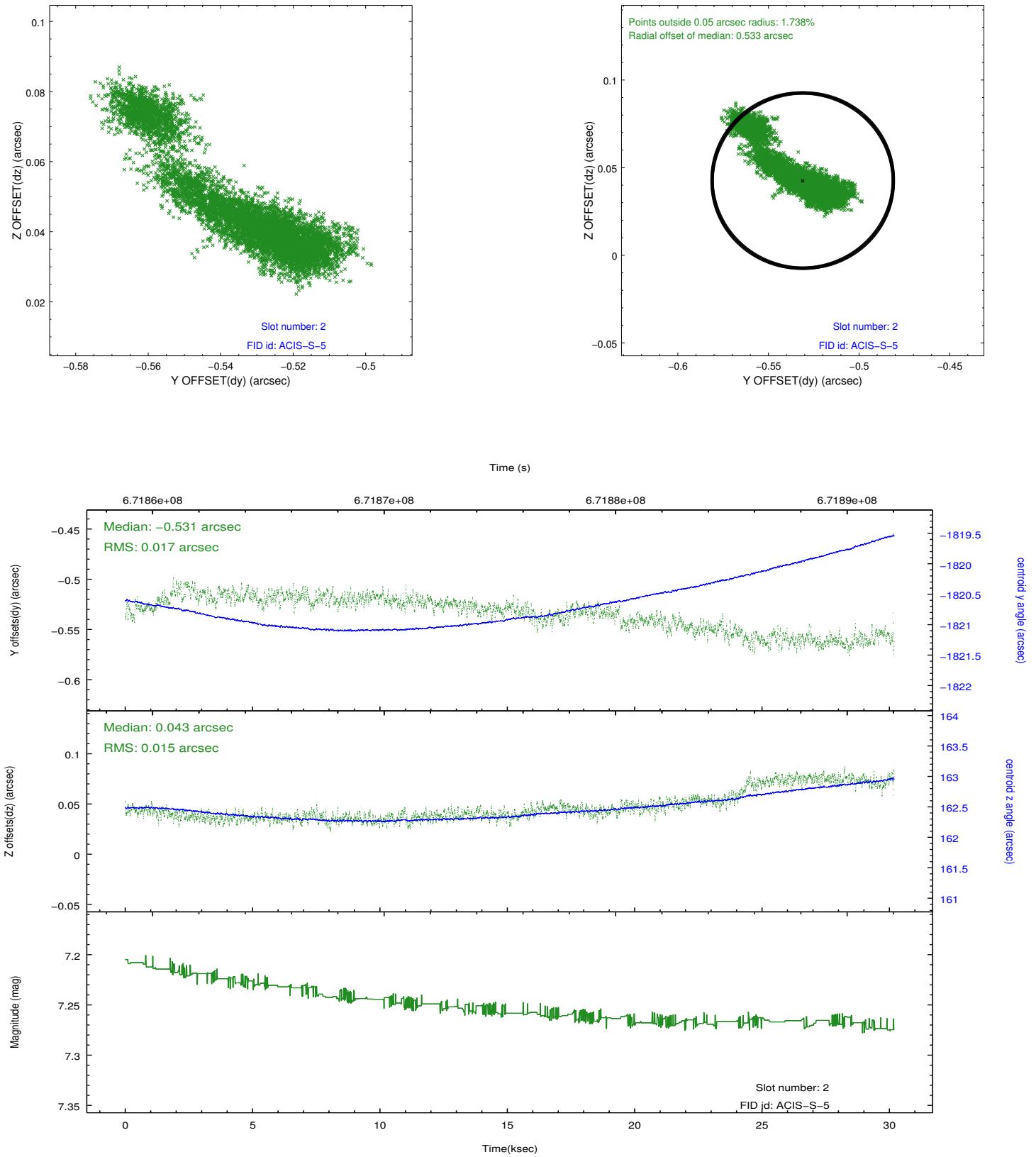
2.5.1 Slot 0



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)	2019.04.18
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	30.081

A.2 Comments

Joint proposal with NOAO,

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The guide star in slot 7 was removed from the aspect solution due to poor data quality. The aspect solution is improved by the removal of this guide star from the solution.

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The focal plane temperature is warmer than -112.0 C during the interval 671880133.61 - 671890522.61 (MET s) of this observation. This temperature is the upper limit of the verified ACIS calibration for the back-illuminated chips. 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.