

V&V Reference Report

L2 ASCDS Version : 8.5.1.1

Observation 13402 - L2 Version 2
Chandra X-Ray Center

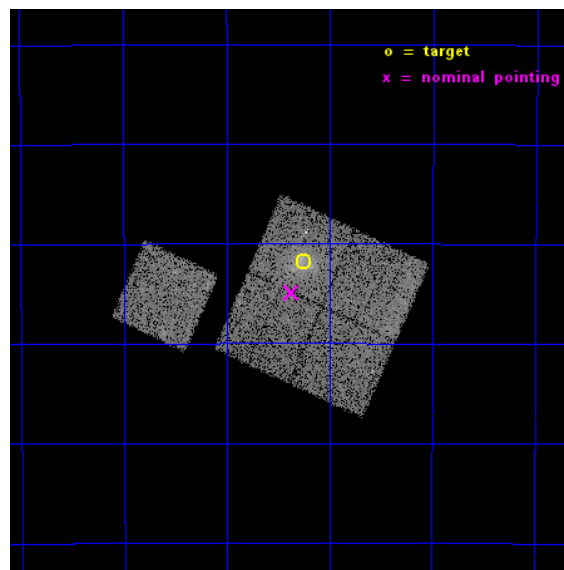
L2 Processing Date : Dec 1 2014

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1 Front

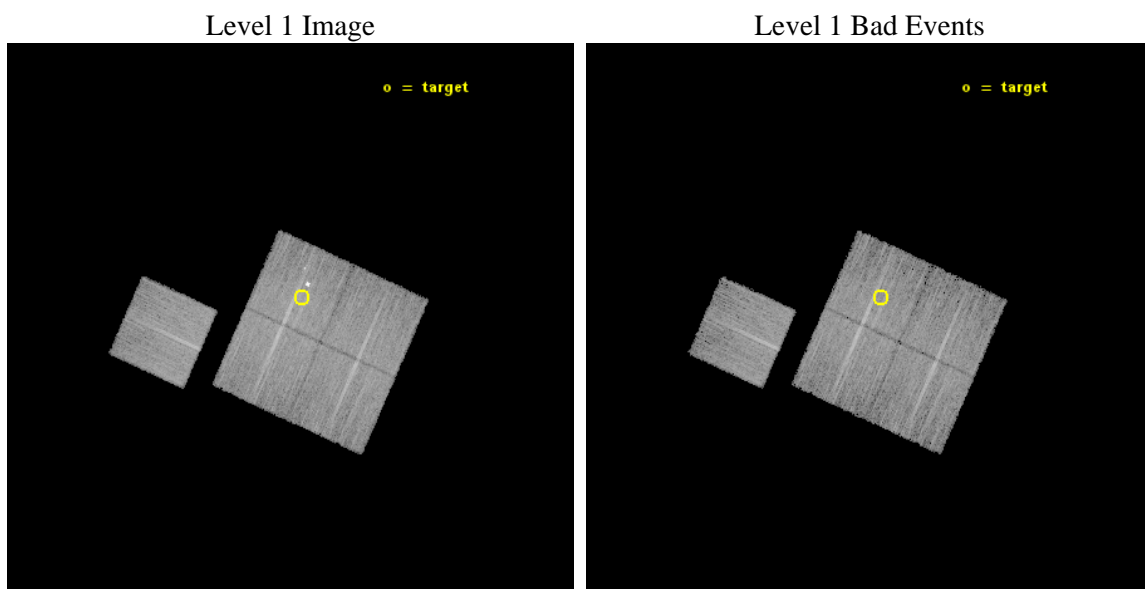
seq_num	801089	Sequence number
obs_id	13402	Observation id
title	Chandra Observation of the Most Massive Galaxy Clusters Detected in the South Pole Telescope Survey	Proposal title
observer	Professor Gordon Garmire	Principal investigator
object	SPT-CLJ0304-4401	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	46.064167	Observer's specified target RA [deg]
dec_targ	-44.031194	Observer's specified target Dec [deg]
ra_nom	46.092768358201	Nominal RA [deg]
dec_nom	-44.081571588219	Nominal Dec [deg]
roll_nom	294.26378693136	Nominal Roll [deg]
revision	2	Processing version of data
ontime	15081.500115991	Sum of GTIs [s]
livetime	14884.449214136	Livetime [s]
ontime0	15081.500115991	Sum of GTIs [s]
ontime1	15081.500115991	Sum of GTIs [s]
ontime2	15078.359135628	Sum of GTIs [s]
ontime3	15081.500115991	Sum of GTIs [s]
ontime6	15078.359135628	Sum of GTIs [s]
l2events	42440	Number of level 2 events



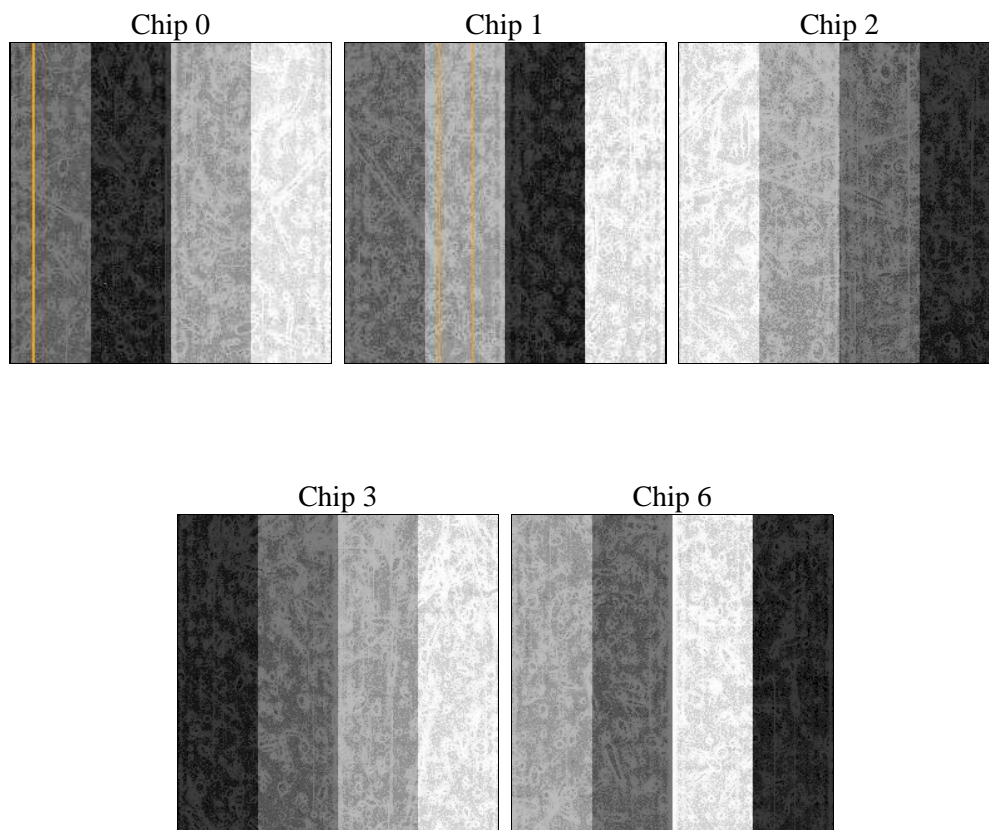
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	15000.000000	[s] Scheduled observation exposure time
ascdsver	10.3	Processing system revision	ontime	15081.500115991	Sum of GTIs [s]
caldbver	4.6.4	 	ontime0	15081.500115991	Sum of GTIs [s]
date	2014-12-01T08:32:39	Date and time of file creation	ontime1	15081.500115991	Sum of GTIs [s]
revision	2	Processing version of data	ontime2	15078.359135628	Sum of GTIs [s]
			ontime3	15081.500115991	Sum of GTIs [s]
			ontime6	15078.359135628	Sum of GTIs [s]
			l1events	401723	Number of level 1 events

2.1.4 Events

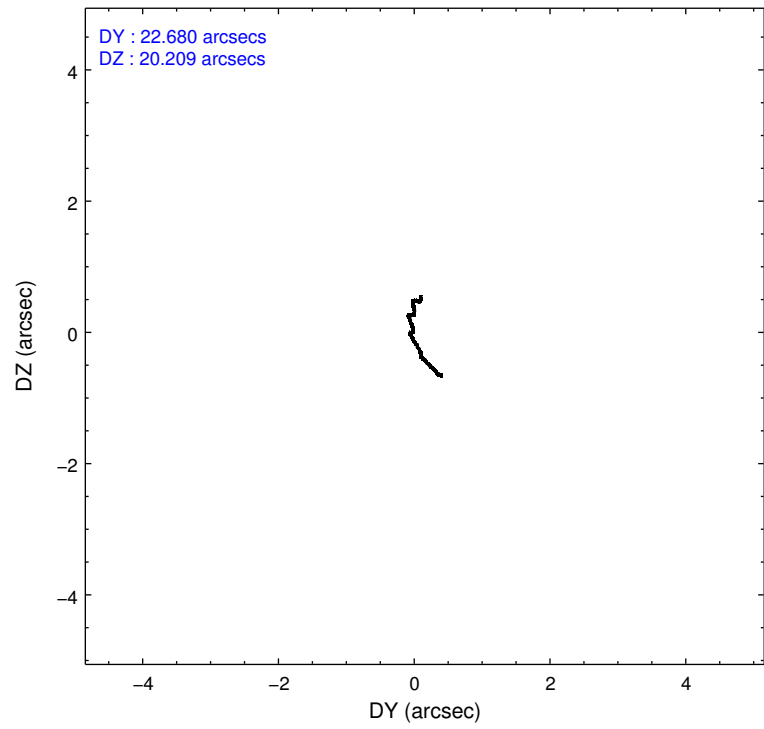
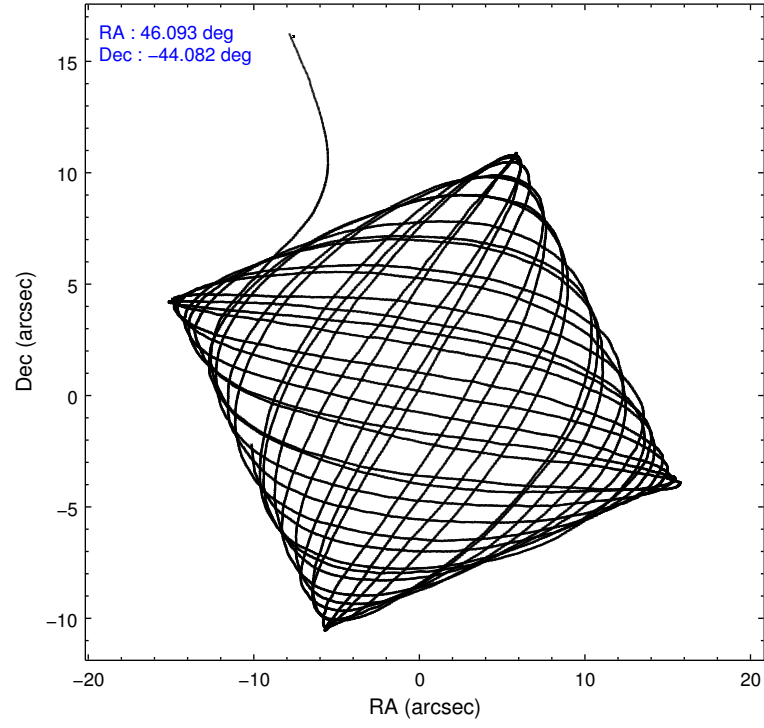
	ccd 0	ccd 1	ccd 2	ccd 3	ccd 6
level 1 events	75048	74309	82059	86604	83703
rejected events	65960	64023	73161	70515	74177
rejected %	87%	86%	89%	81%	88%

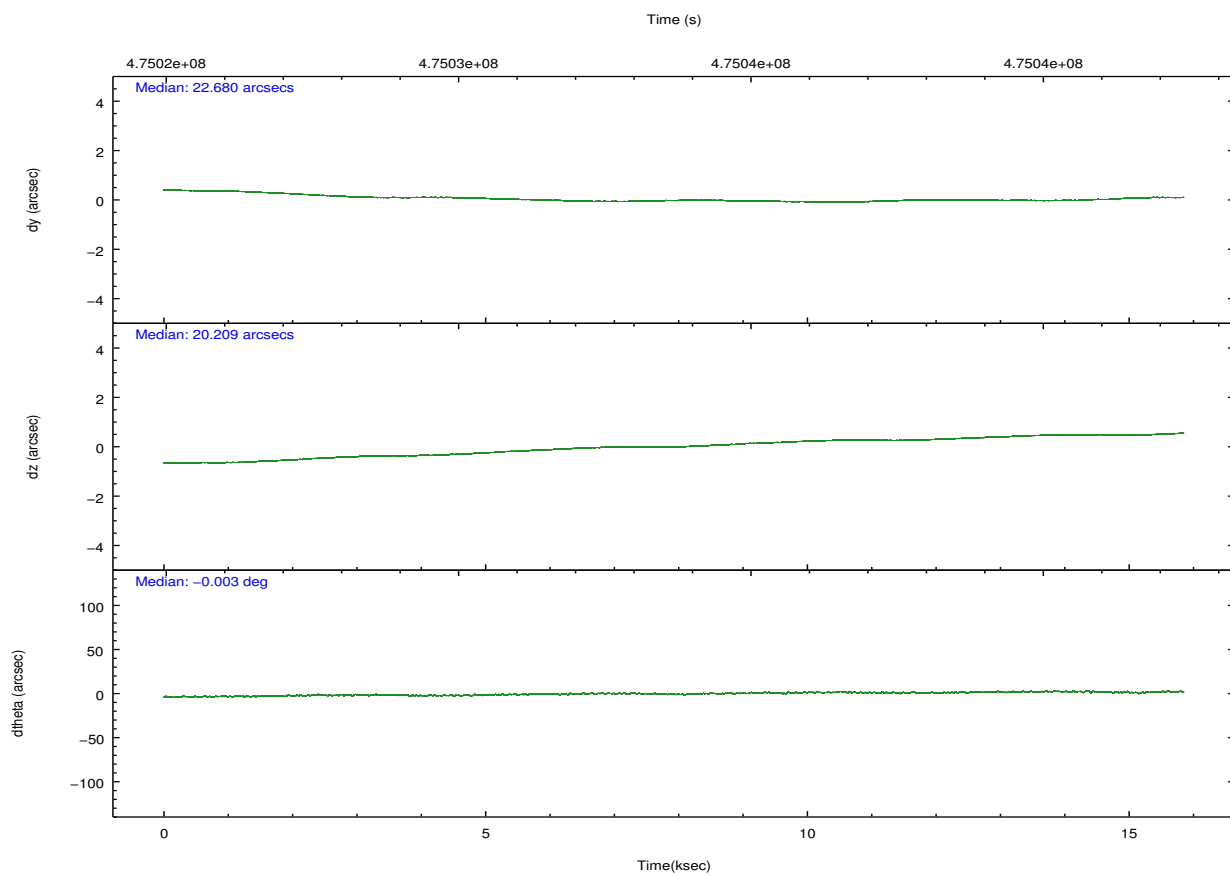
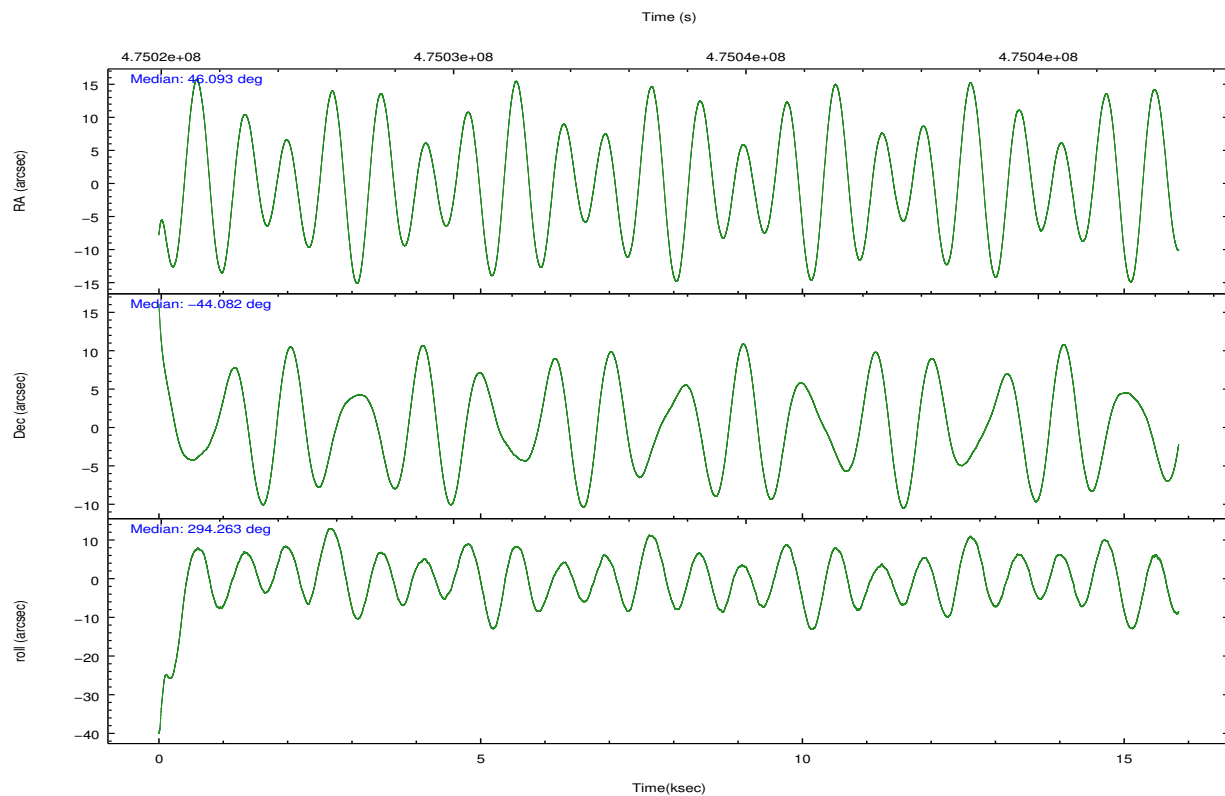
	ccd 0	ccd 1	ccd 2	ccd 3	ccd 6
grade 0 events	3160	3524	3255	9894	3187
	4%	4%	3%	11%	3%
grade 1 events	49	36	48	80	33
	0%	0%	0%	0%	0%
grade 2 events	2205	2509	2130	2246	2188
	2%	3%	2%	2%	2%
grade 3 events	949	955	898	1007	953
	1%	1%	1%	1%	1%
grade 4 events	861	999	914	977	948
	1%	1%	1%	1%	1%
grade 5 events	3552	3788	3398	4185	3831
	4%	5%	4%	4%	4%
grade 6 events	1915	2302	1703	1969	2252
	2%	3%	2%	2%	2%
grade 7 events	62357	60196	69713	66246	70311
	83%	81%	84%	76%	84%

2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-01236	ACIS-01236	Obspar file type	PREDICTED	ACTUAL
Grating	NONE	NONE	Obspar update status	NONE	UPDATED
Data mode	VFAINT	VFAINT	CCD I0 on	Y	Y
Observation mode	POINTING	POINTING	CCD I1 on	Y	Y
[deg] Pointing RA	46.061636	46.09276835820119	CCD I2 on	Y	Y
[deg] Pointing Dec	-44.065585	-44.08157158821938	CCD I3 on	Y	Y
[deg] Pointing Roll	294.033464	294.263786931357	CCD S0 on	N	N
[mm] SIM focus pos	-0.782348	-0.7809083437167272	CCD S1 on	N	N
[mm] SIM defocus	0	0.001439871863259334	CCD S2 on	O1	Y
[mm] SIM translation stage pos	-225.840463	-225.8433433320239	CCD S3 on	N	N
[mm] SIM translation stage offset	-7.752	-7.749109670905796	CCD S4 on	N	N
[s] Observation start time (MET)	475026607.184000	475024911.77961	CCD S5 on	N	N
Observation start date	2013-01-19T23:49:00	2013-01-19T23:21:51	Number of optional ACIS chips dropped	0	0
[s] Observation end time (MET)	475041607.184000	475042924.61808	On-chip summing requested	N	N
Observation end date	2013-01-20T03:59:00	2013-01-20T04:22:04	Subarray requested	NONE	NONE
Read mode	TIMED	TIMED	Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	3.1

2.3 Aspect



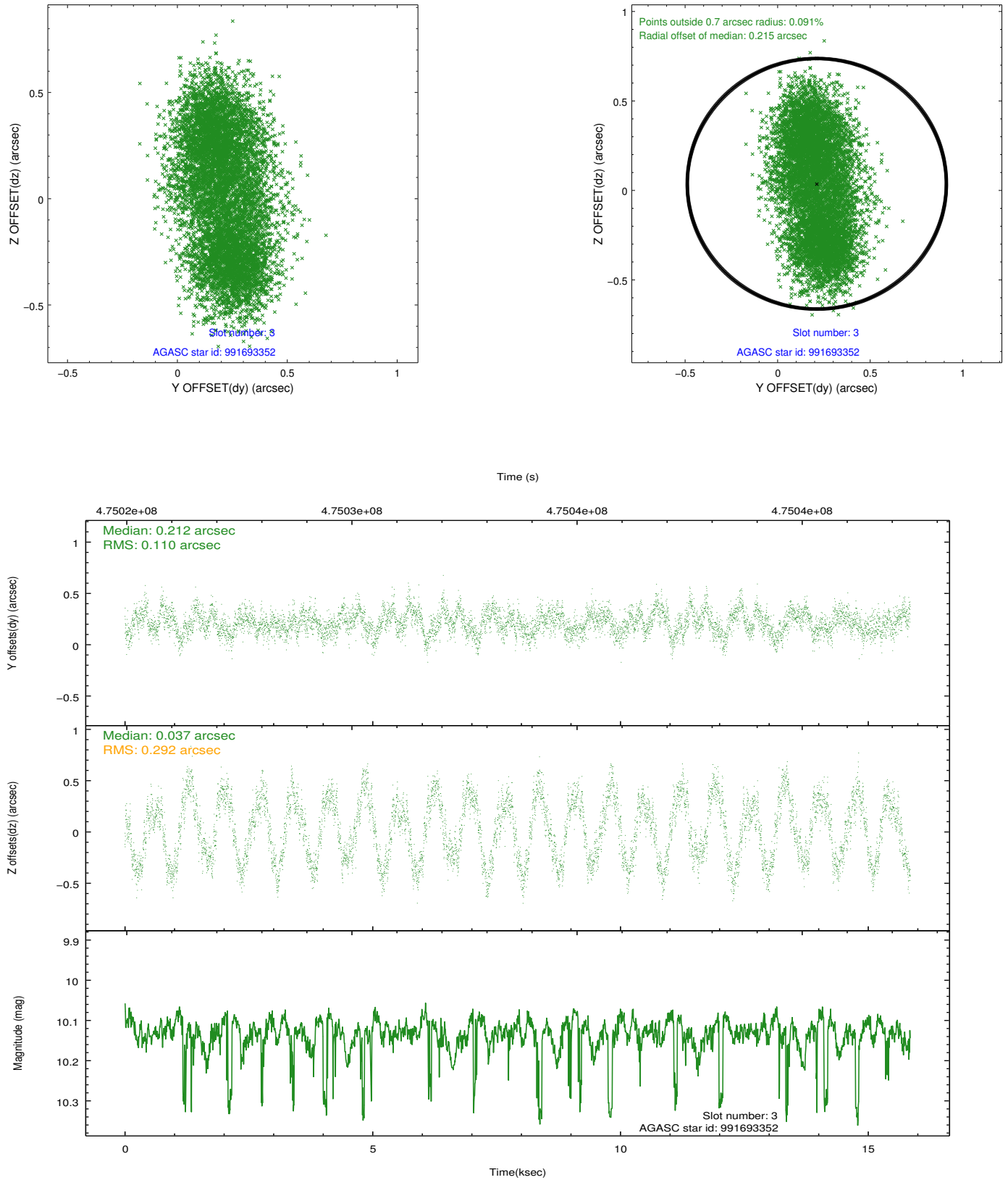


Slot Statistics

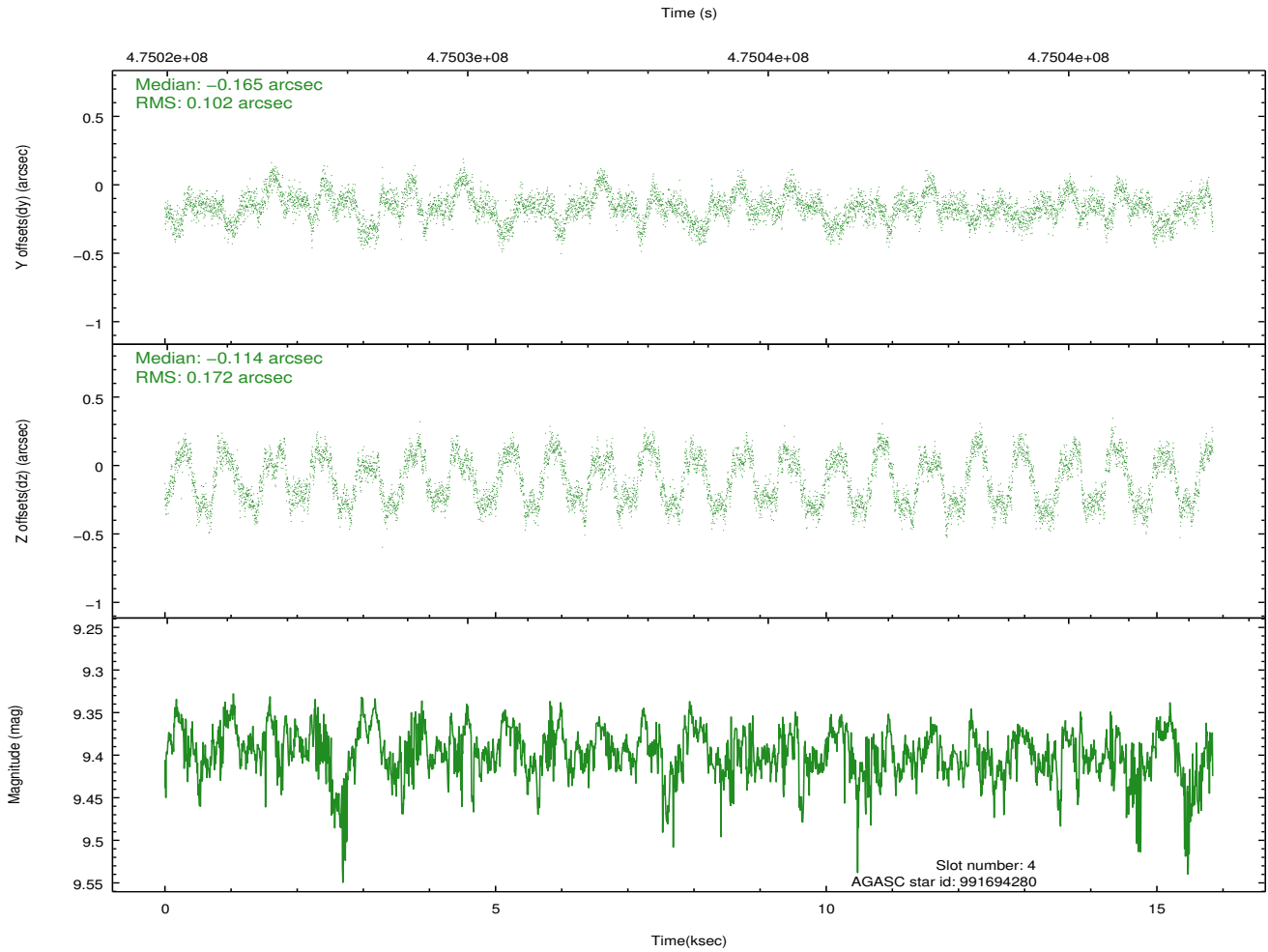
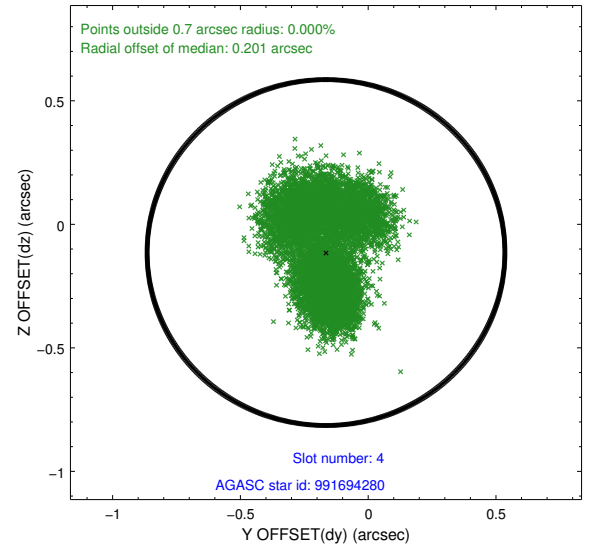
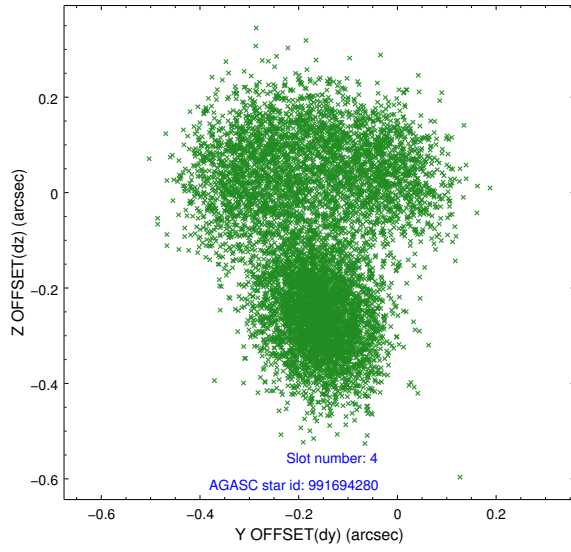
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-I-1	7.17	3866	0.151	-0.136	0.020	0.036	0.000000	0.000000	916.54	-1003.12
1	FID		ACIS-I-5	7.16	3866	-0.374	0.094	0.013	0.019	0.000000	0.000000	-1831.99	894.34
2	FID		ACIS-I-6	7.17	3866	0.131	0.111	0.012	0.024	0.000000	0.000000	381.70	1539.24
3	GUIDE	used	991693352	10.13	7668	0.212	0.037	0.345	0.515	45.330551	-44.204297	-304.23	-1929.13
4	GUIDE	used	991694280	9.40	7672	-0.165	-0.114	0.223	0.312	46.215227	-44.248609	763.46	93.08
5	GUIDE	used	991697056	8.52	7721	0.182	0.449	0.116	0.178	45.854986	-44.053710	-255.65	-470.54
6	GUIDE	used	991823824	9.20	7725	-0.067	-0.150	0.116	0.180	46.893315	-44.474373	2224.17	1347.52
7	GUIDE	used	991831104	8.76	7672	-0.181	-0.214	0.139	0.203	47.133250	-44.314207	1958.64	2149.52

2.4 Star Slots

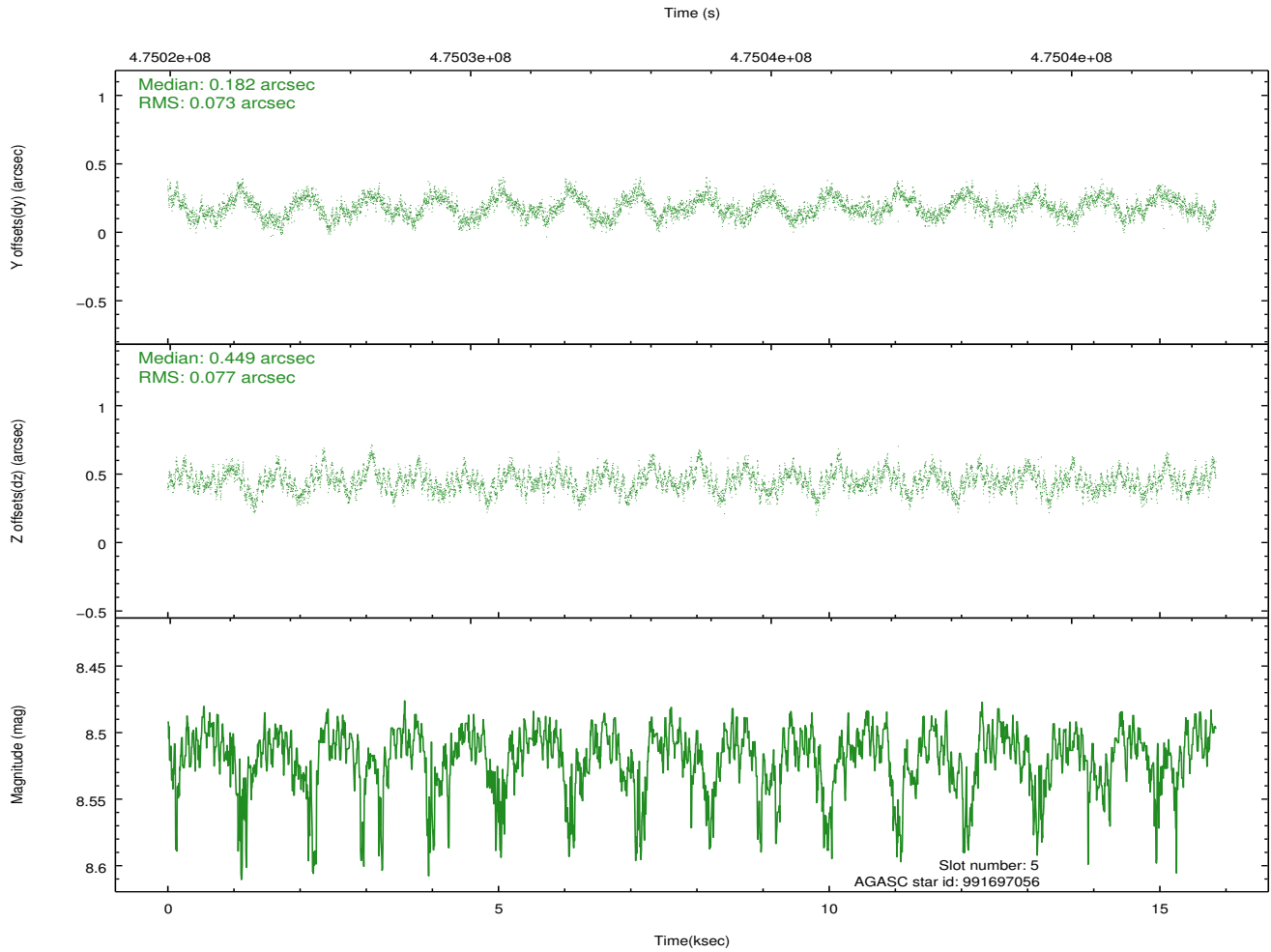
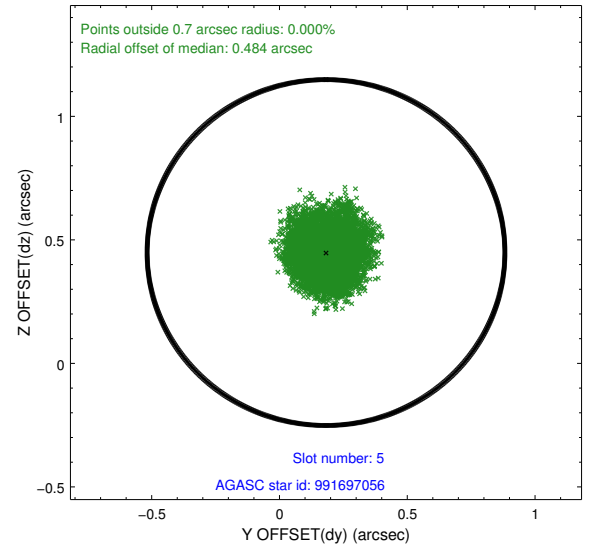
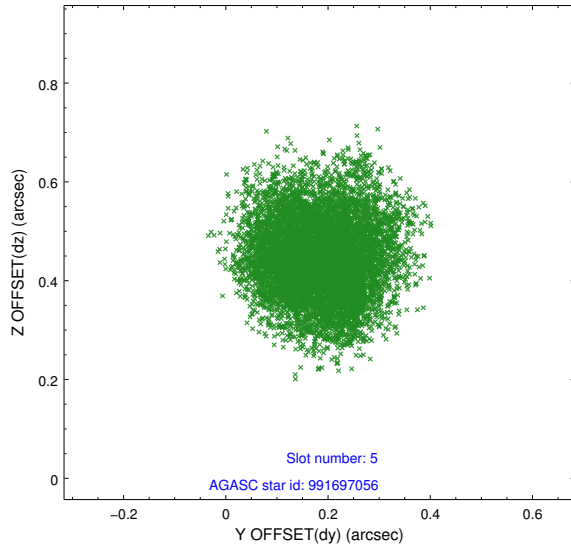
2.4.1 Slot 3



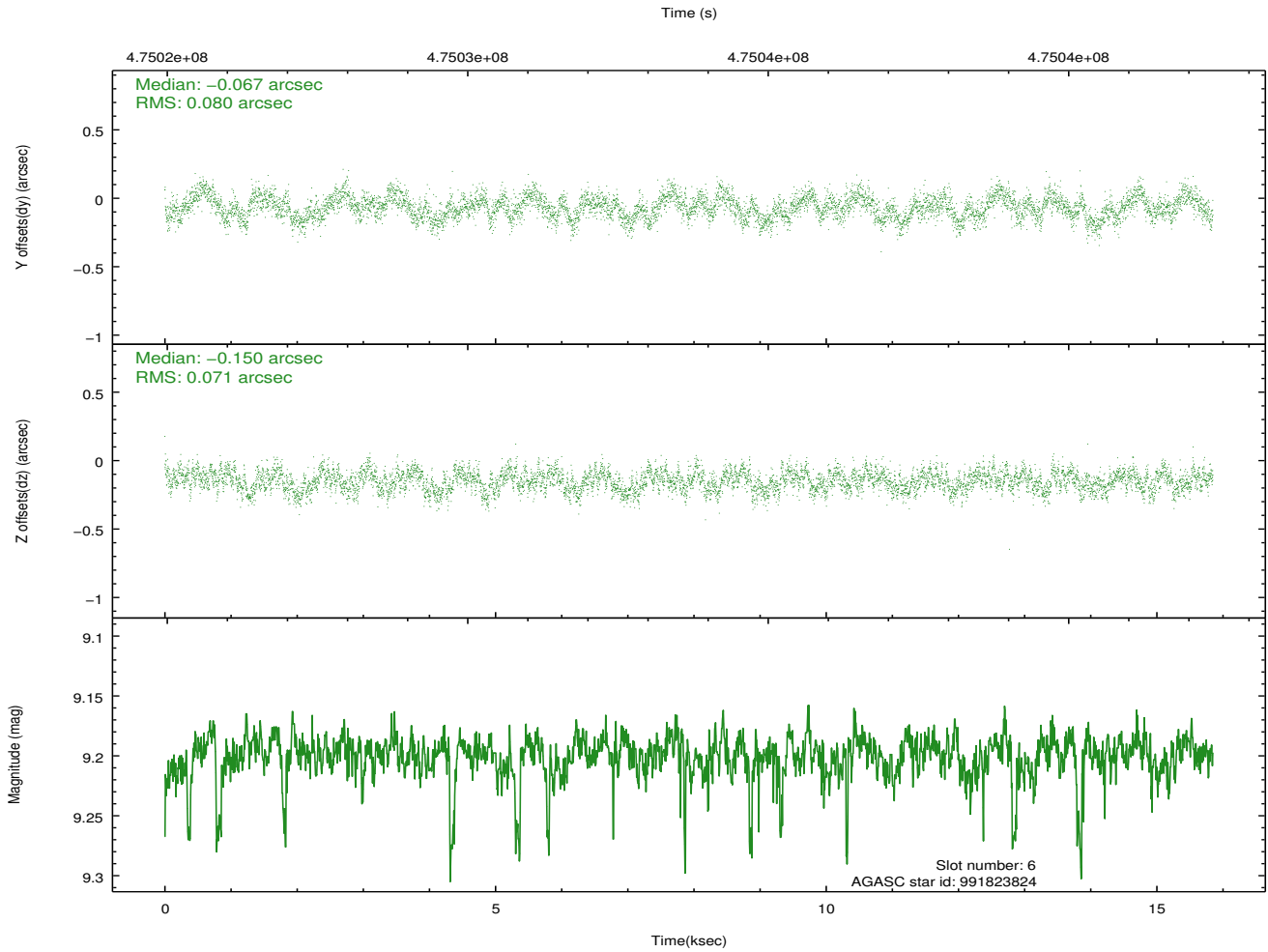
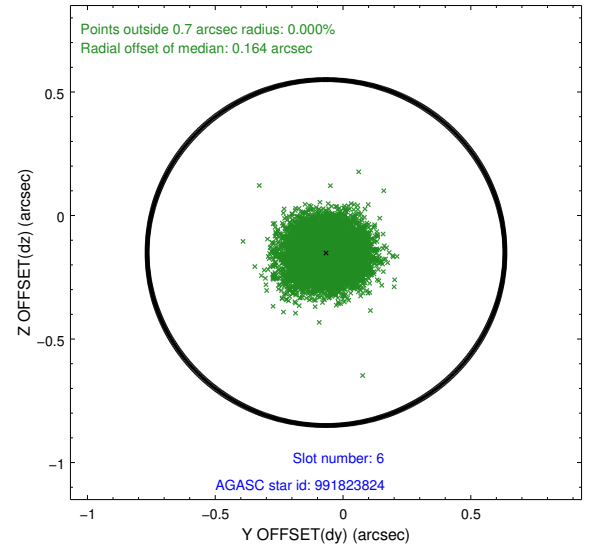
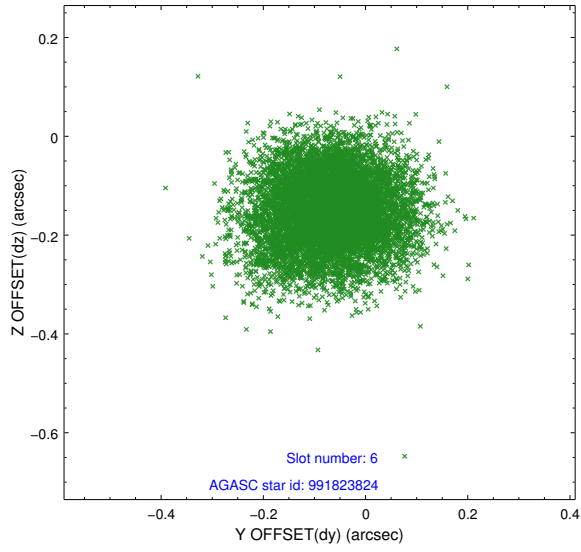
2.4.2 Slot 4



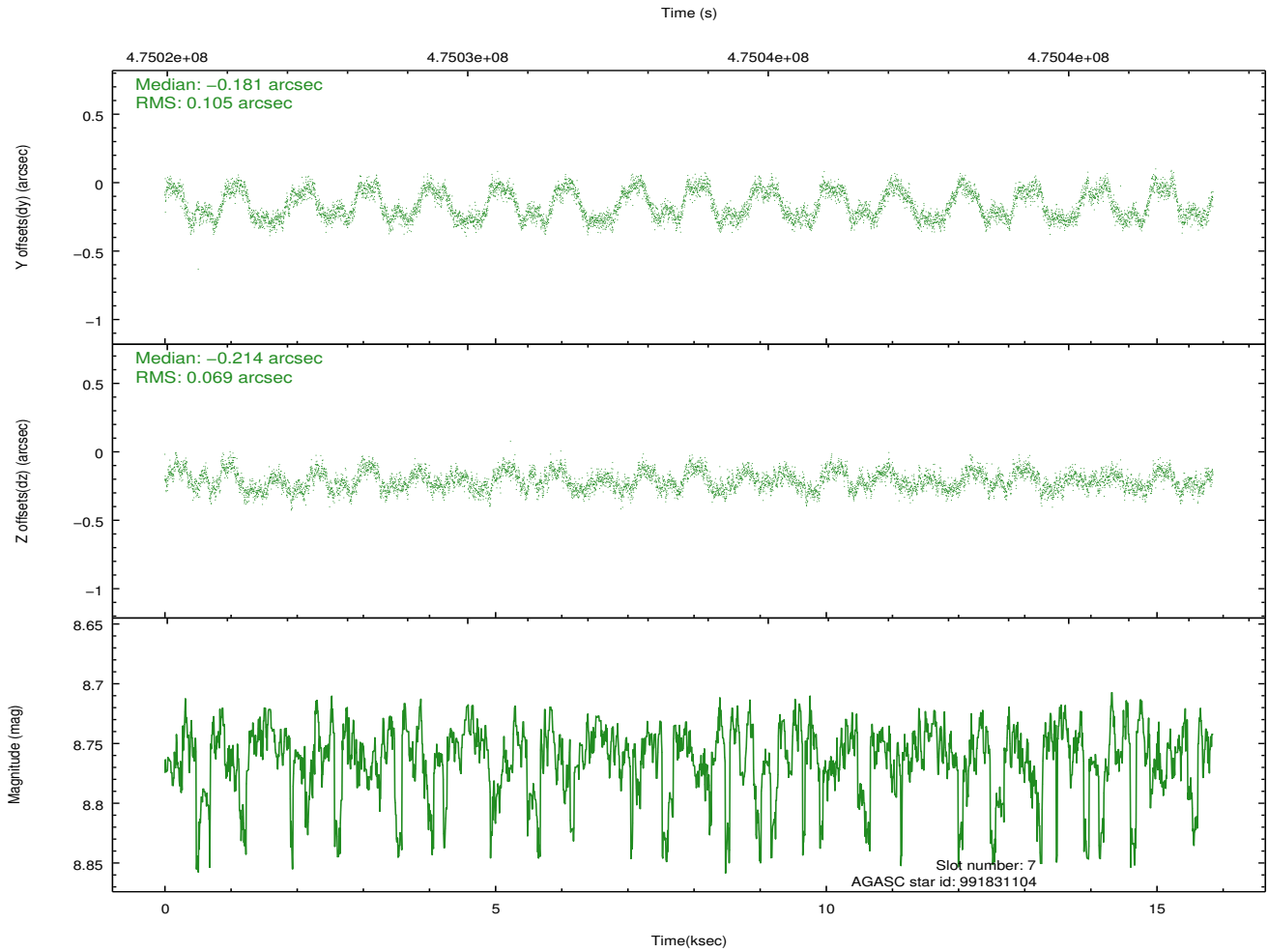
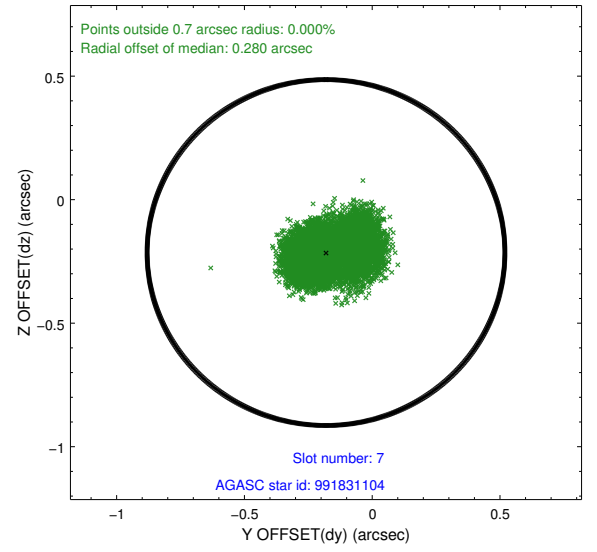
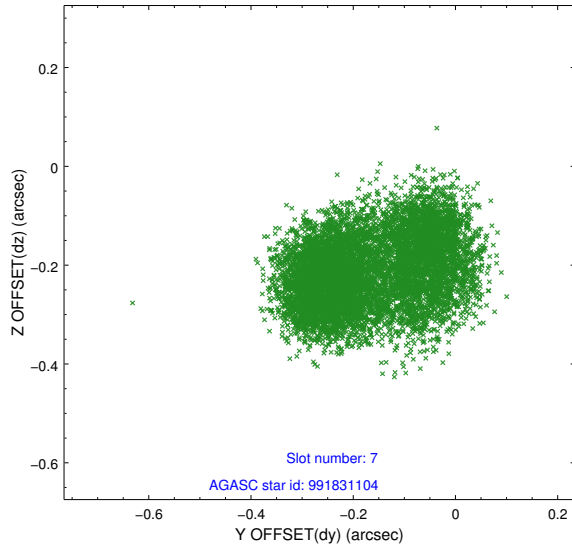
2.4.3 Slot 5



2.4.4 Slot 6

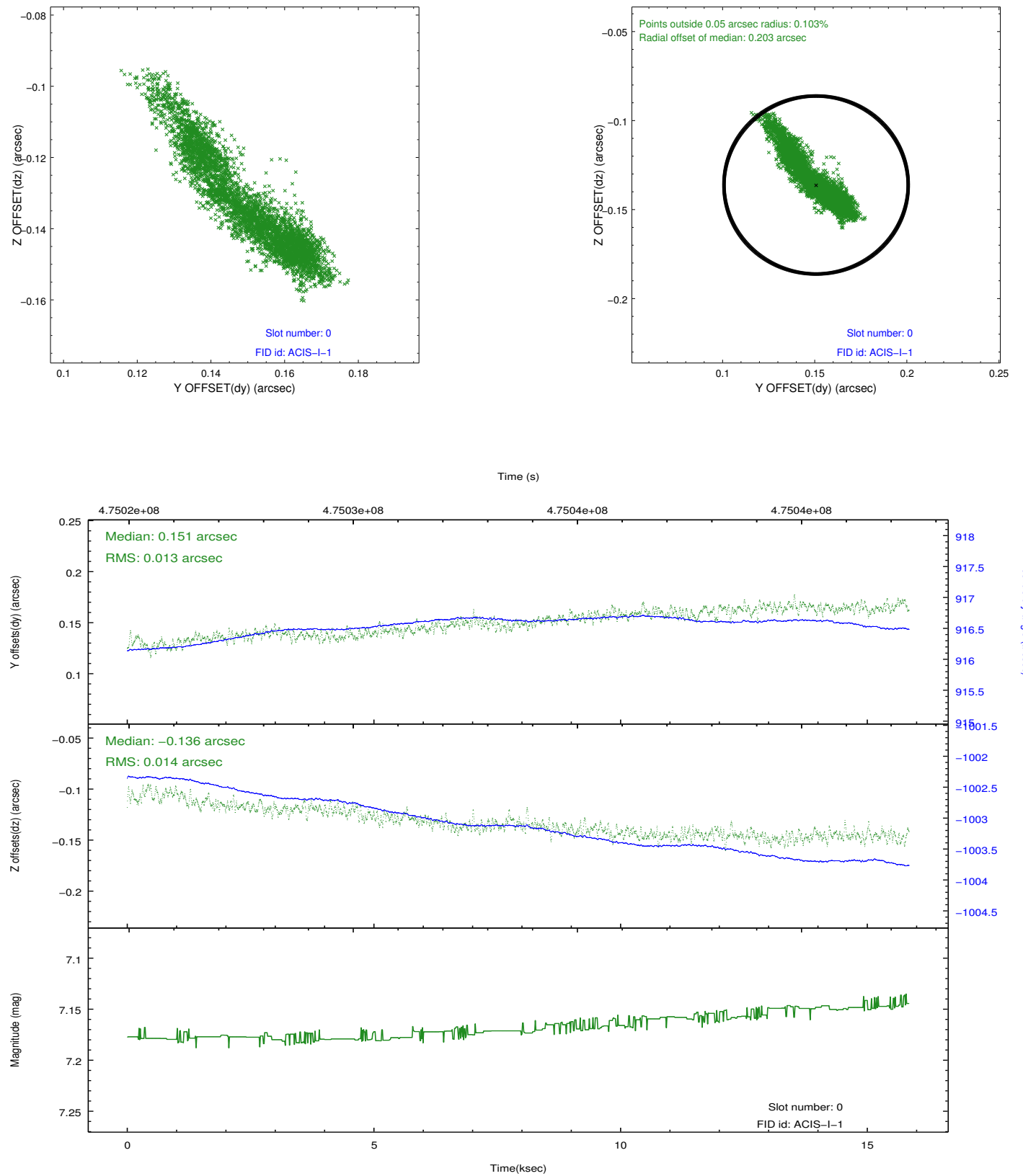


2.4.5 Slot 7

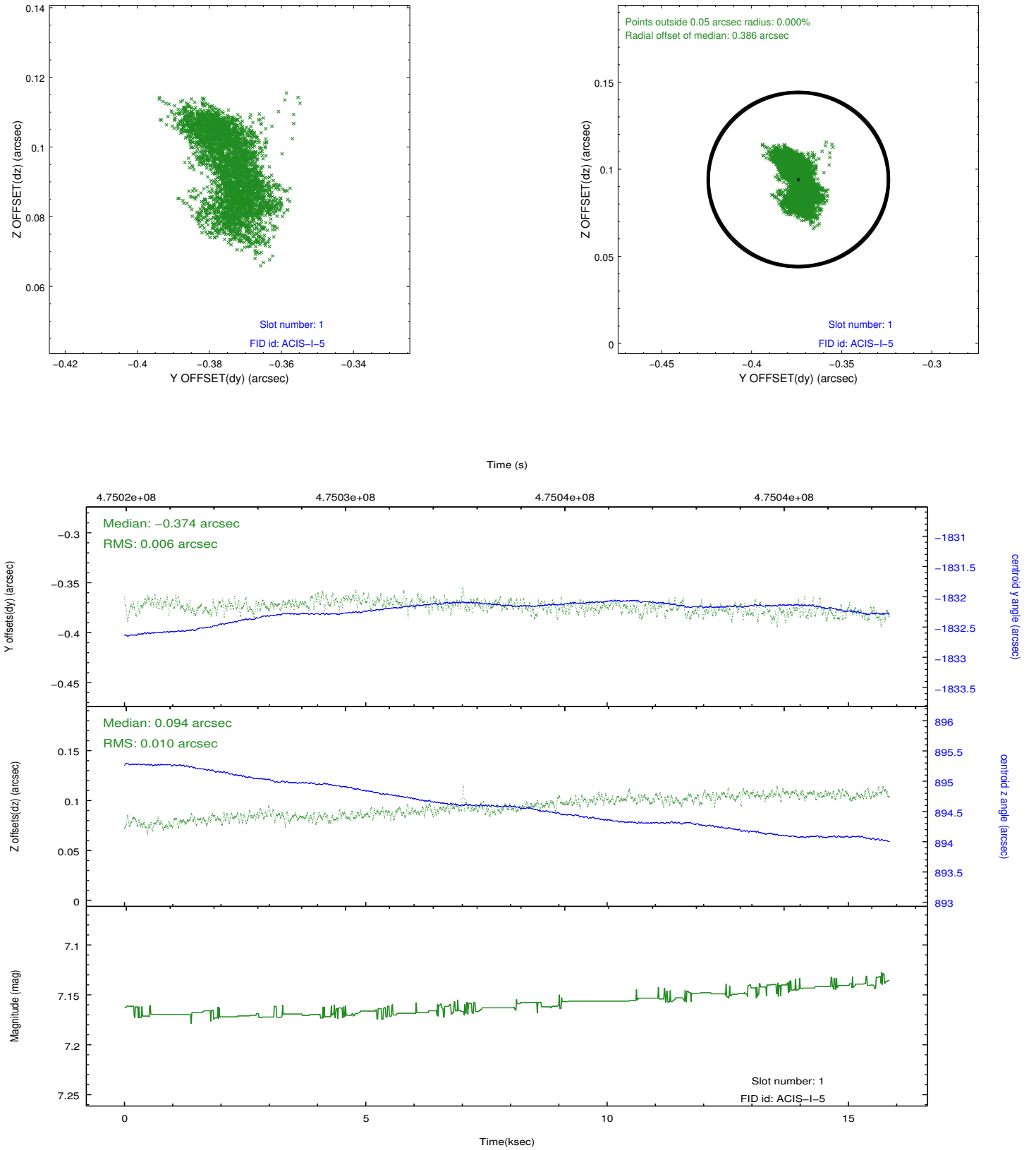


2.5 FID Slots

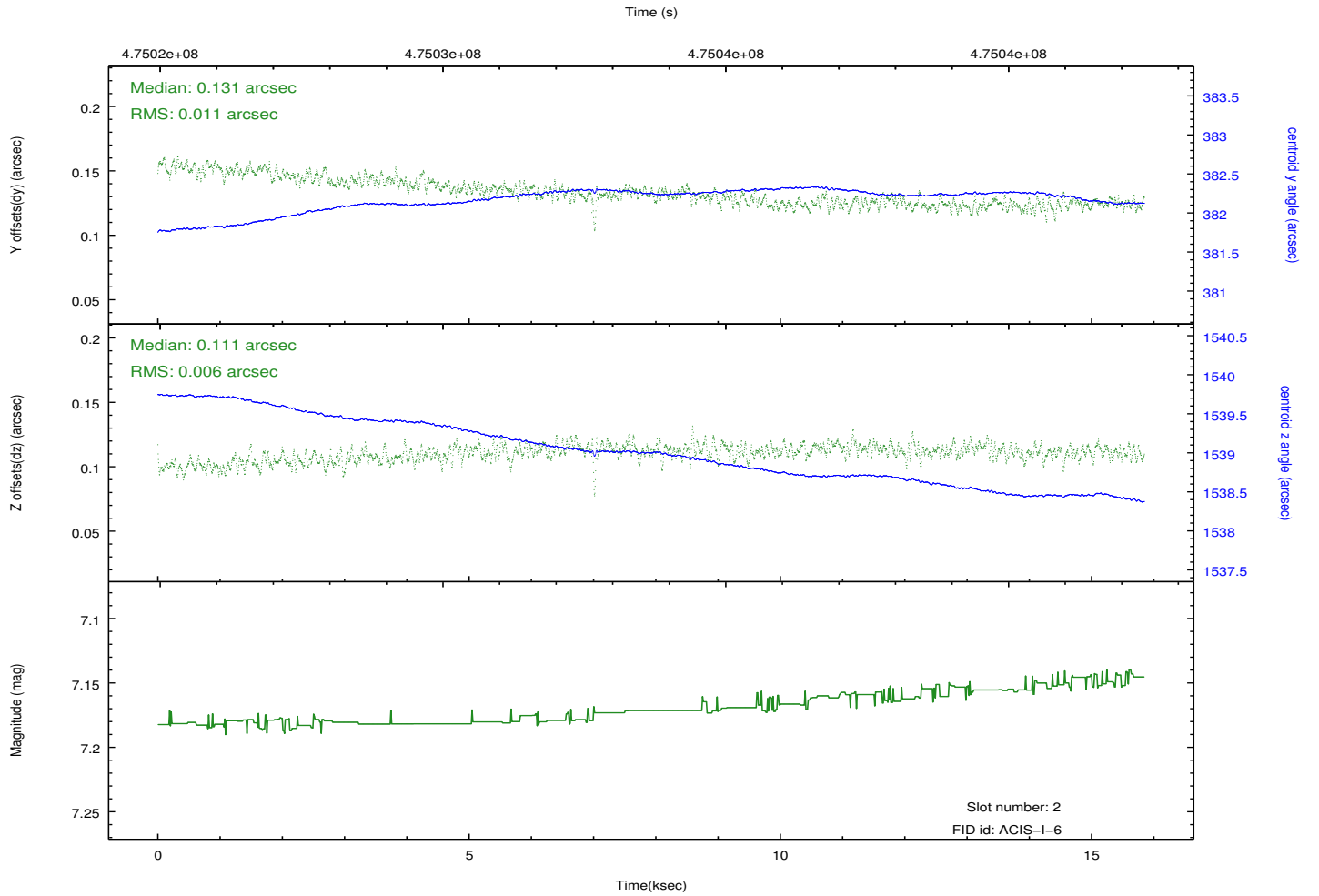
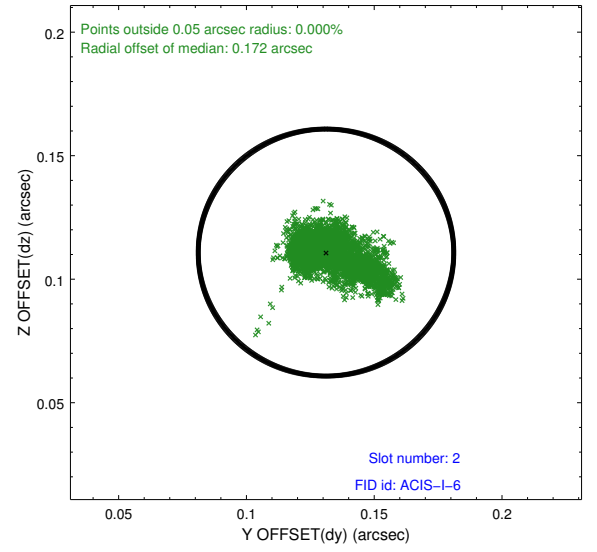
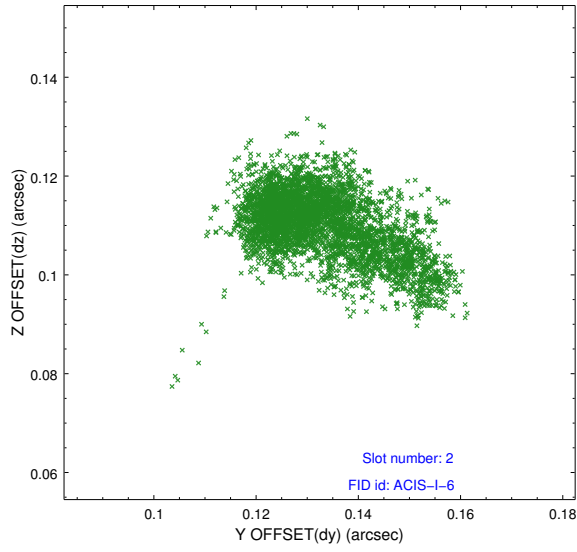
2.5.1 Slot 0



2.5.2 Slot 1



2.5.3 Slot 2



A Summary

A.1 Status

V&V Scientist	Beth Sundheim
V&V Date (YYYY-MM-DD)	2018.03.06
V&V Edition	2
V&V Disposition and Status	OK
V&V Charge Time	15.081500115991

A.2 Comments

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.

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These data have been reprocessed with new aspect alignment calibration files that correct small mean offsets (up to 0.4 arcsecs) and improve overall astrometric accuracy. The new calibration was determined using data from the time period being reprocessed and was performed using cross-correlation of X-ray sources with radio and optical counterparts.

