

V&V Reference Report

L2 ASCDS Version : 10.6.4.1

Observation 21534 - L2 Version 1
Chandra X-Ray Center

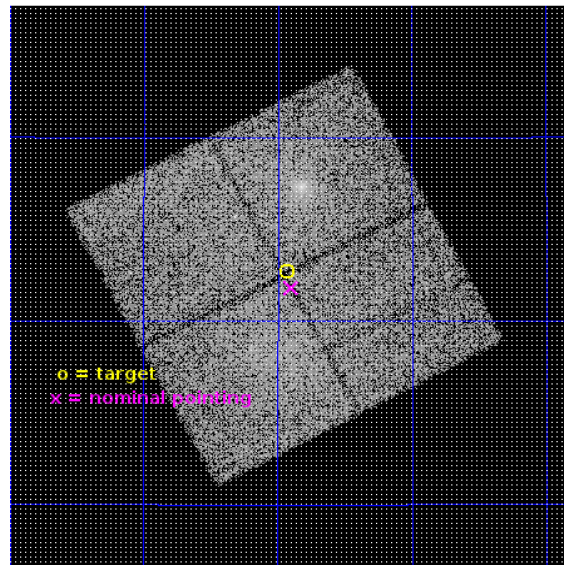
L2 Processing Date : Sep 28 2018

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1 Front

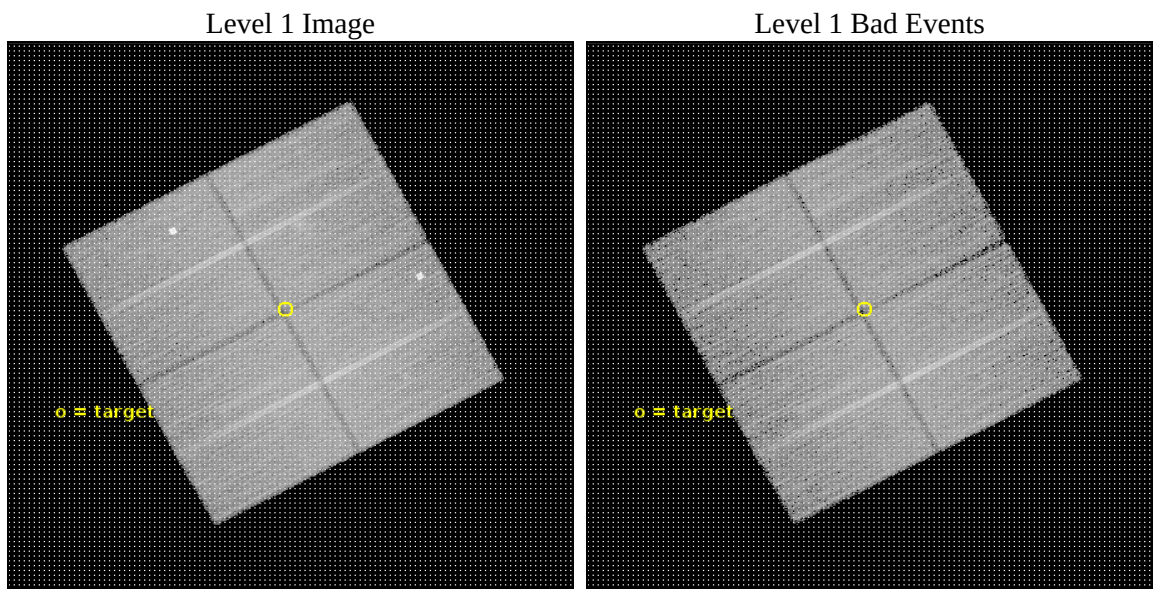
seq_num	801818	Sequence number
obs_id	21534	Observation id
title	Deep Chandra Observations of the Shock Front and Faint Filament in the Pre-Merger Cluster Abell 98	Proposal title
observer	Scott Randall	Principal investigator
object	Abell 98	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	11.615833	Observer's specified target RA [deg]
dec_targ	20.544667	Observer's specified target Dec [deg]
ra_nom	11.612152688964	Nominal RA [deg]
dec_nom	20.530211057333	Nominal Dec [deg]
roll_nom	152.20998485272	Nominal Roll [deg]
revision	1	Processing version of data
ontime	30074.862194777	Sum of GTIs [s]
livetime	29681.91197941	Livetime [s]
ontime0	30077.96222508	Sum of GTIs [s]
ontime1	30074.862194777	Sum of GTIs [s]
ontime2	30074.903244853	Sum of GTIs [s]
ontime3	30078.08534503	Sum of GTIs [s]
l2events	93029	Number of level 2 events



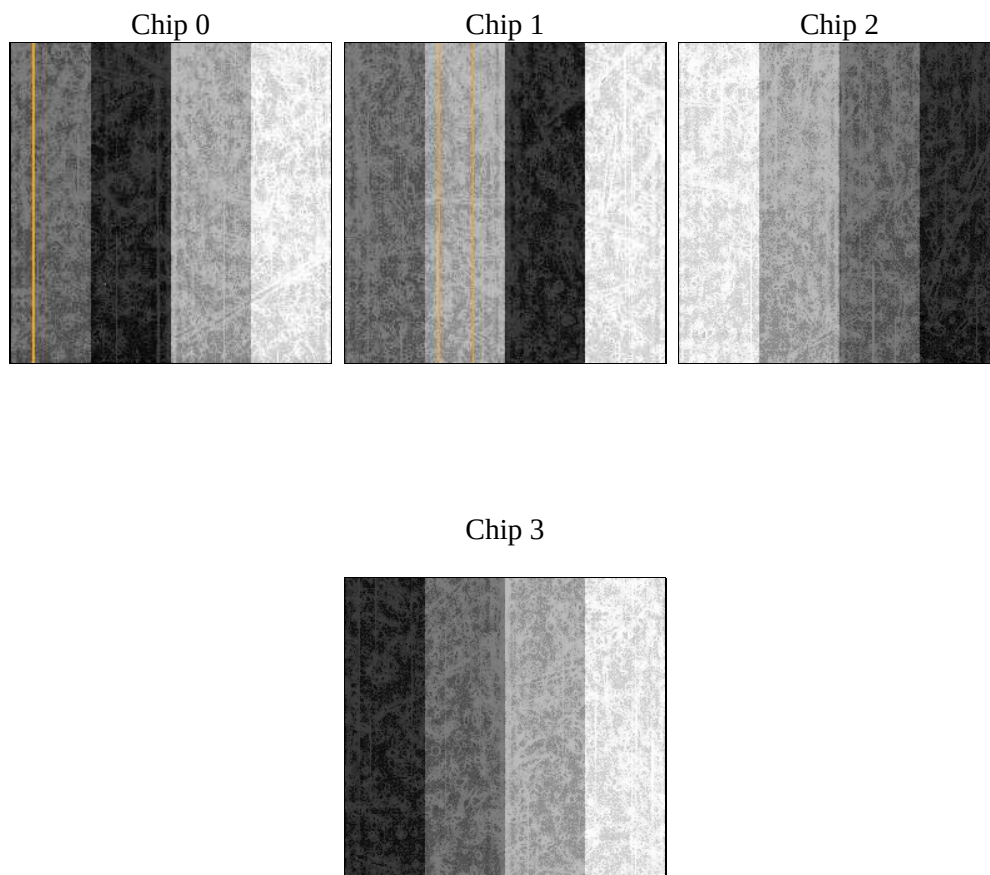
2 OBI

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	10.6.4.1	Processing system revision	ontime	30074.862194777	Sum of GTIs [s]
caldbver	4.8.0	 	ontime0	30077.96222508	Sum of GTIs [s]
date	2018-09-28T15:42:00	Date and time of file creation	ontime1	30074.862194777	Sum of GTIs [s]
revision	1	Processing version of data	ontime2	30074.903244853	Sum of GTIs [s]
			ontime3	30078.08534503	Sum of GTIs [s]
			l1events	908474	Number of level 1 events

2.1.4 Events

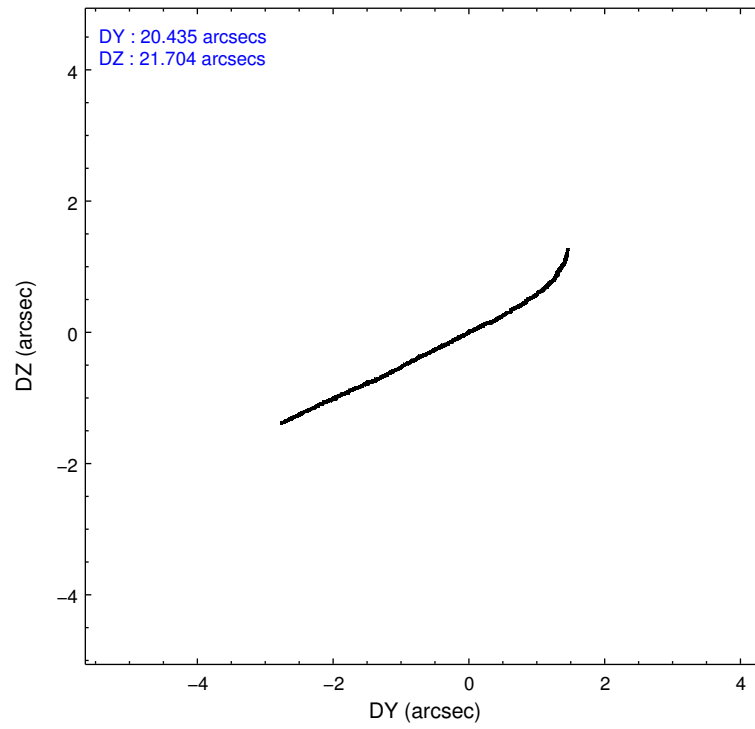
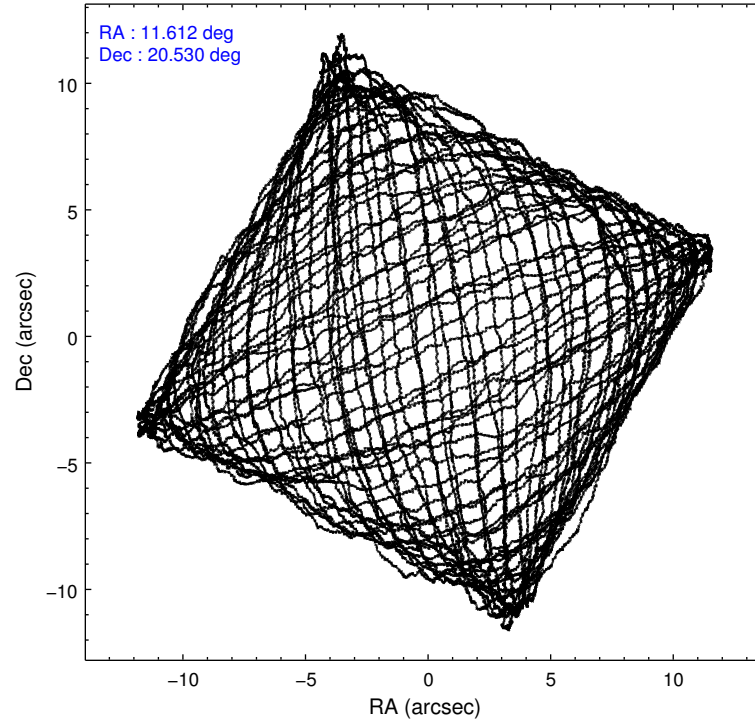
	ccd 0	ccd 1	ccd 2	ccd 3
level 1 events	219797	218711	239696	230270
rejected events	190097	185786	210221	203150
rejected %	86%	84%	87%	88%

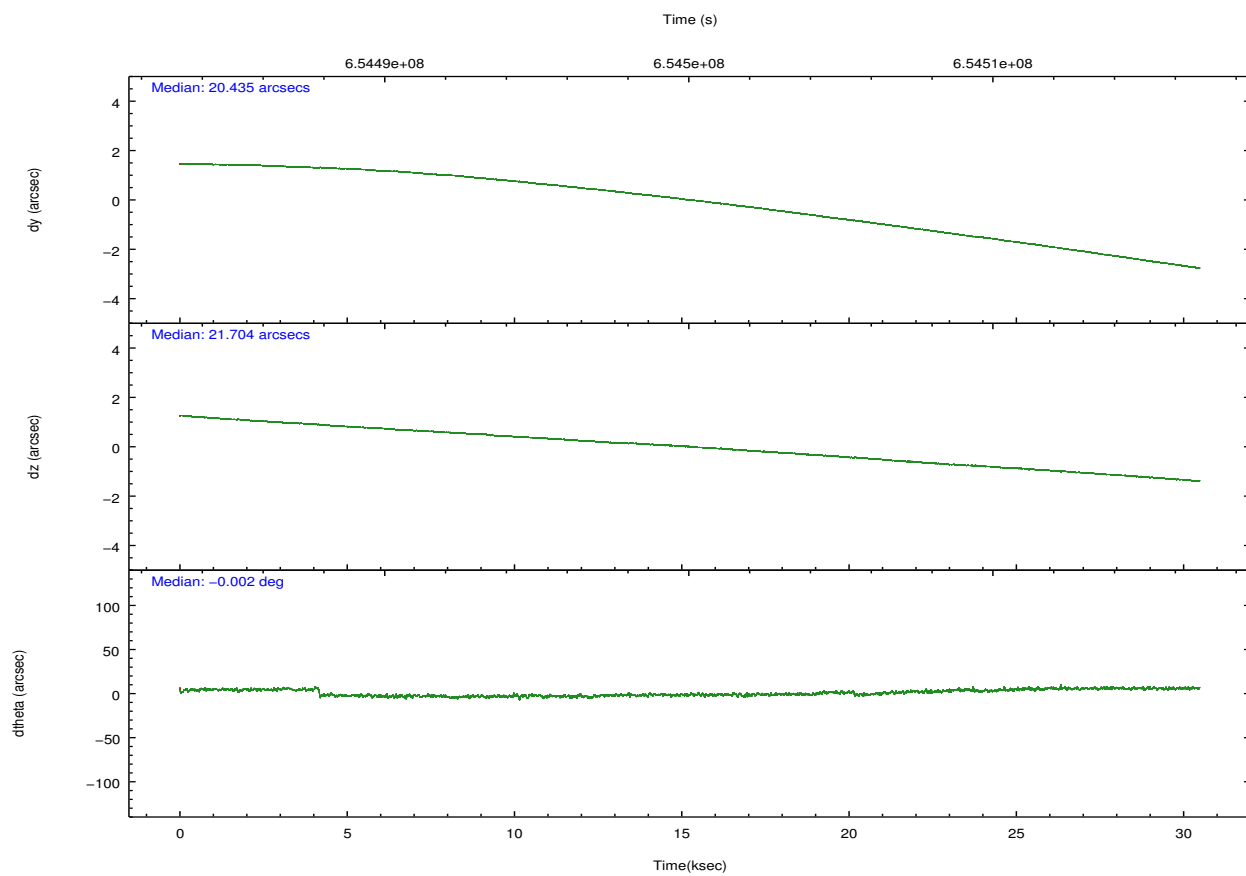
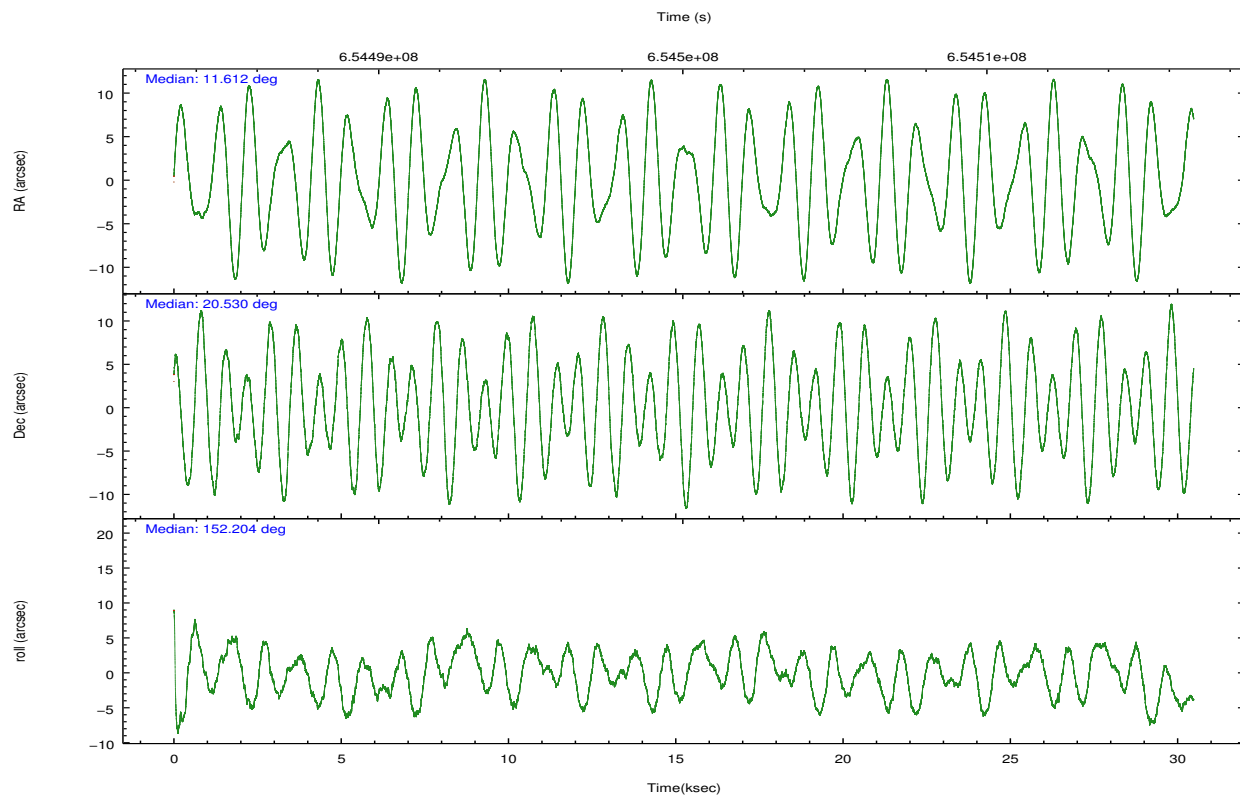
	ccd 0	ccd 1	ccd 2	ccd 3
grade 0 events	12113	14609	13572	11094
	5%	6%	5%	4%
grade 1 events	111	129	161	148
	0%	0%	0%	0%
grade 2 events	6705	6819	5990	5603
	3%	3%	2%	2%
grade 3 events	2727	2450	2464	2563
	1%	1%	1%	1%
grade 4 events	2539	2551	2505	2638
	1%	1%	1%	1%
grade 5 events	9598	9932	9128	10579
	4%	4%	3%	4%
grade 6 events	5617	6500	4949	5227
	2%	2%	2%	2%
grade 7 events	180387	175721	200927	192418
	82%	80%	83%	83%

2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-0123	ACIS-0123	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	11.641580	11.61215268896383	CCD I2 on	Y	Y
[deg] Pointing Dec	20.531381	20.53021105733284	CCD I3 on	Y	Y
[deg] Pointing Roll	151.990970	152.2099848527241	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	N
[mm] SIM translation stage pos	-233.592463	-233.5874344608287	CCD S3 on	N	N
[mm] SIM translation stage offset	0	-0.005018542100998502	CCD S4 on	N	N
[s] Observation start time (MET)	654485246.184000	654484218.16878	CCD S5 on	N	N
Observation start date	2018-09-28T01:26:17	2018-09-28T01:10:18	Number of optional ACIS chips dropped	1	1
[s] Observation end time (MET)	654515246.184000	654516278.12068	On-chip summing requested	N	N
Observation end date	2018-09-28T09:46:17	2018-09-28T10:04:38	Subarray requested	NONE	NONE
Read mode	TIMED	TIMED	Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	3.1

2.3 Aspect



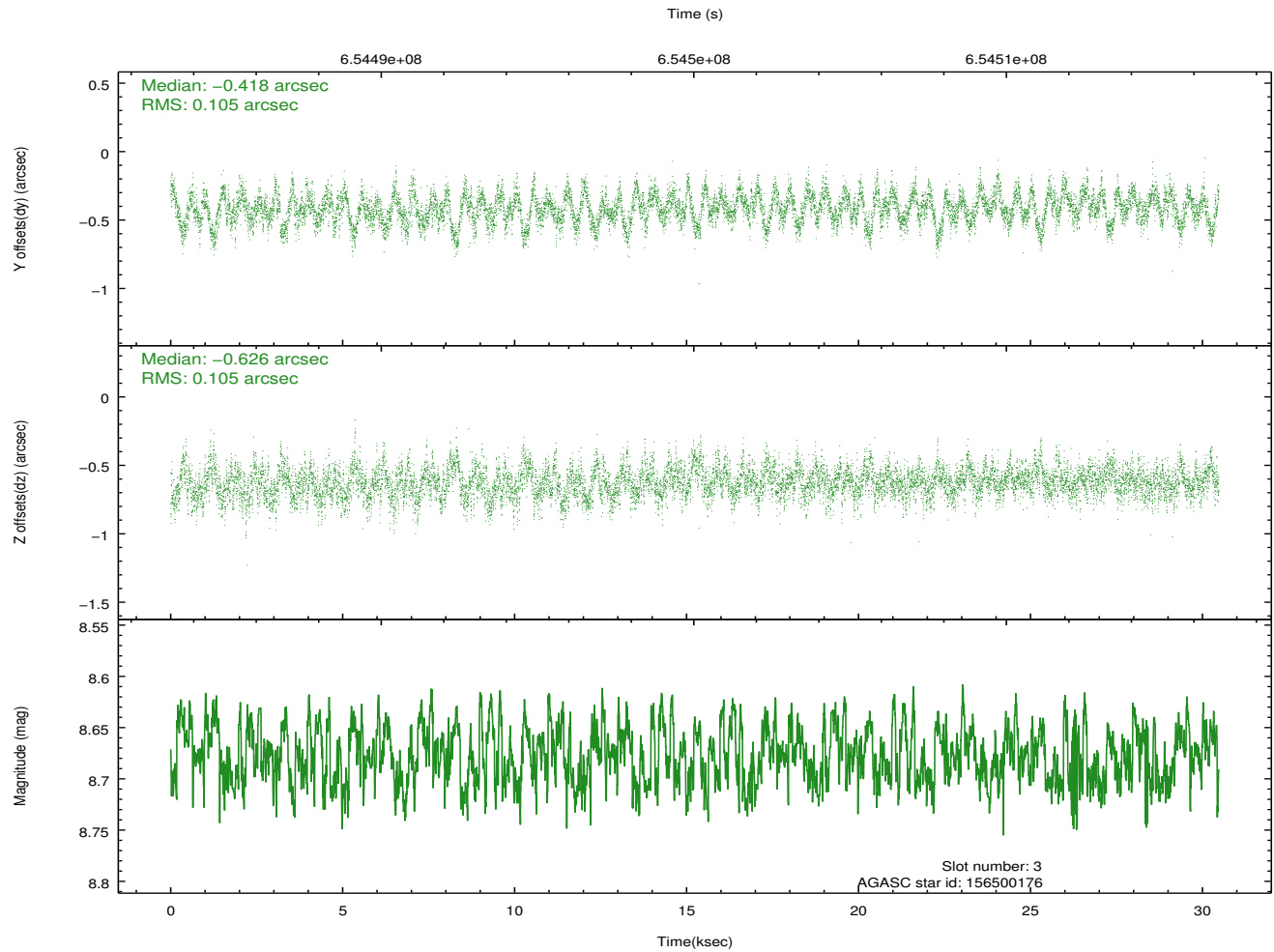
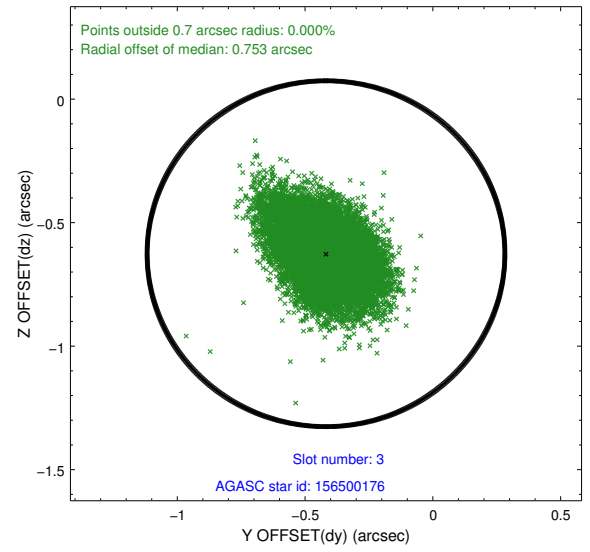
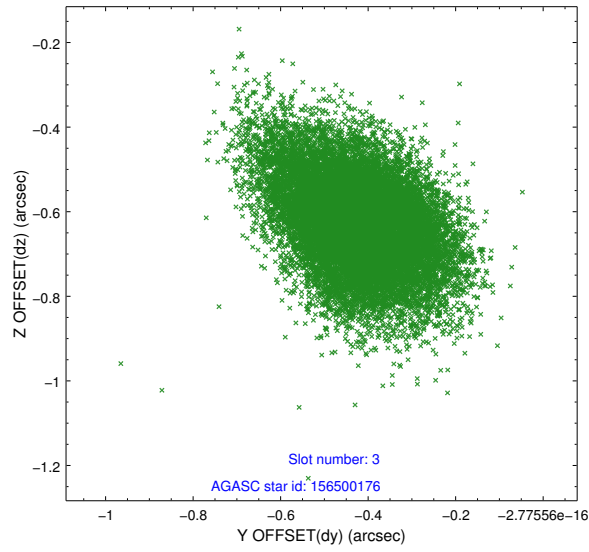


Slot Statistics

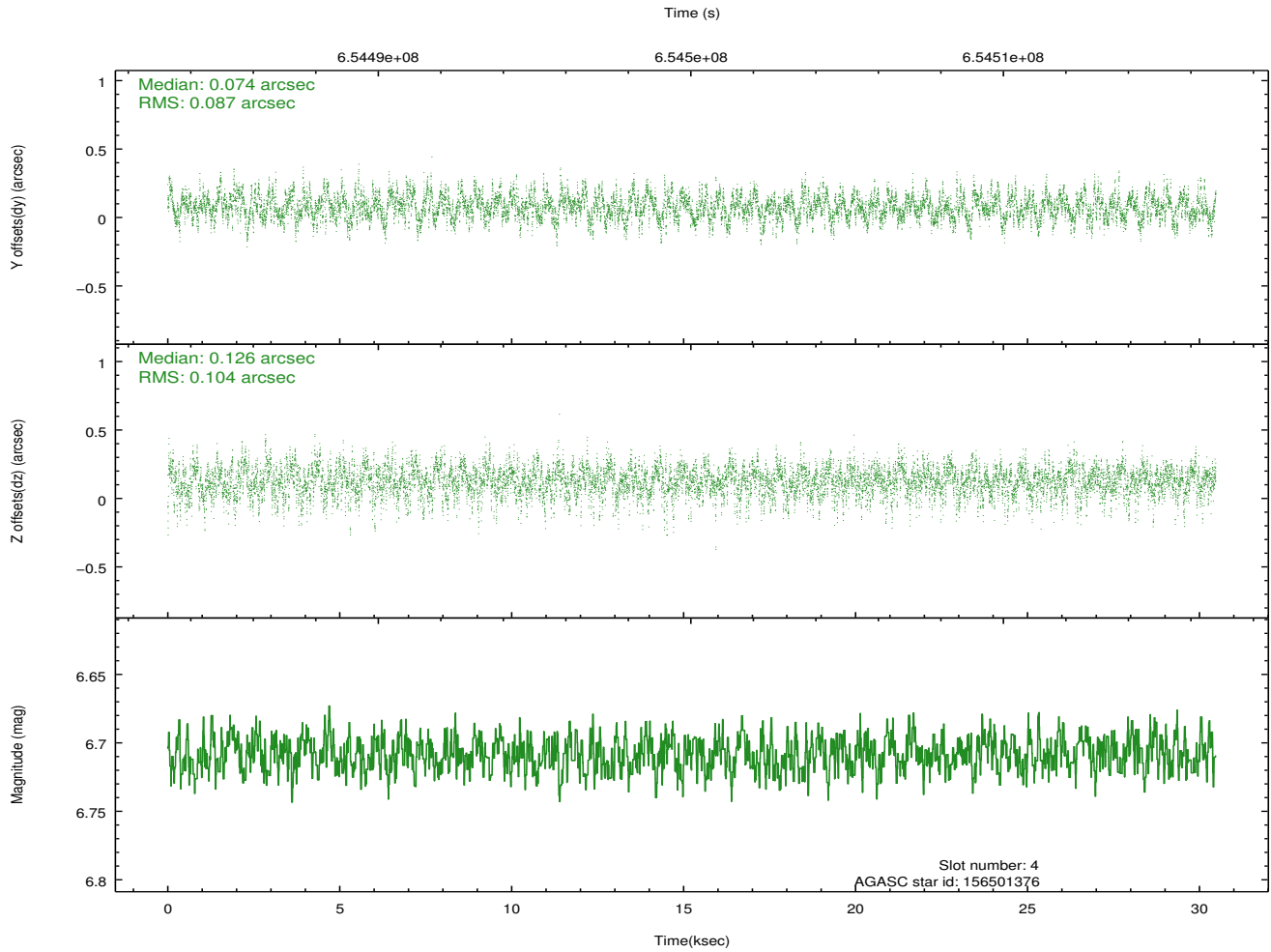
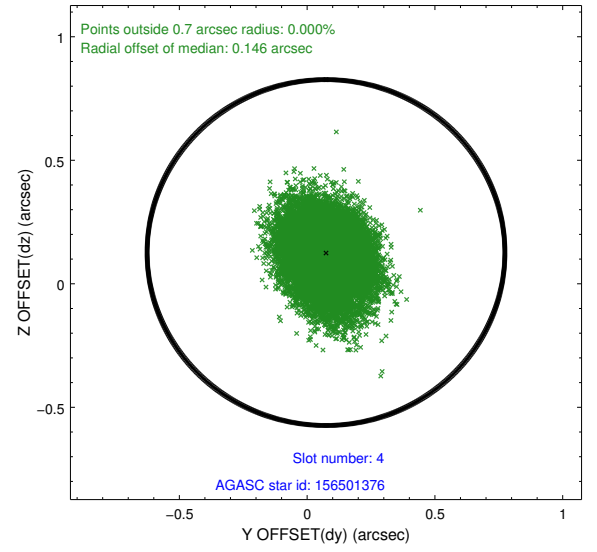
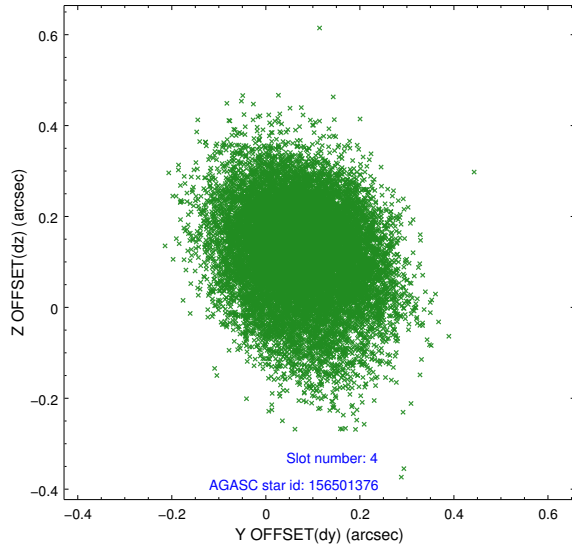
pt	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mea
0	FID		ACIS-I-1	7.22	7435	1.000	-0.074	-0.072	0.030	0.102	0.000000	0.000000	919.01	-845
1	FID		ACIS-I-2	7.12	7432	1.000	-0.361	-0.179	0.020	0.045	0.000000	0.000000	-775.33	-852
2	FID		ACIS-I-4	7.16	7432	1.000	0.335	0.318	0.020	0.062	0.000000	0.000000	2139.27	1054
3	GUIDE	used	156500176	8.68	14859	1.000	-0.418	-0.626	0.155	0.262	11.171670	20.448926	1257.80	1005
4	GUIDE	used	156501376	6.71	14868	1.000	0.074	0.126	0.144	0.236	11.978451	20.925347	-335.31	-1786
5	GUIDE	used	156502176	8.02	14862	1.000	0.198	0.218	0.117	0.205	11.982190	21.024044	-176.65	-2103
6	GUIDE	used	156504328	9.25	14854	1.000	0.223	0.431	0.219	0.342	12.430893	20.736850	-1995.44	-1906
7	GUIDE	used	156509336	7.45	14862	1.000	-0.079	-0.143	0.112	0.197	12.201488	20.214746	-2203.79	115

2.4 Star Slots

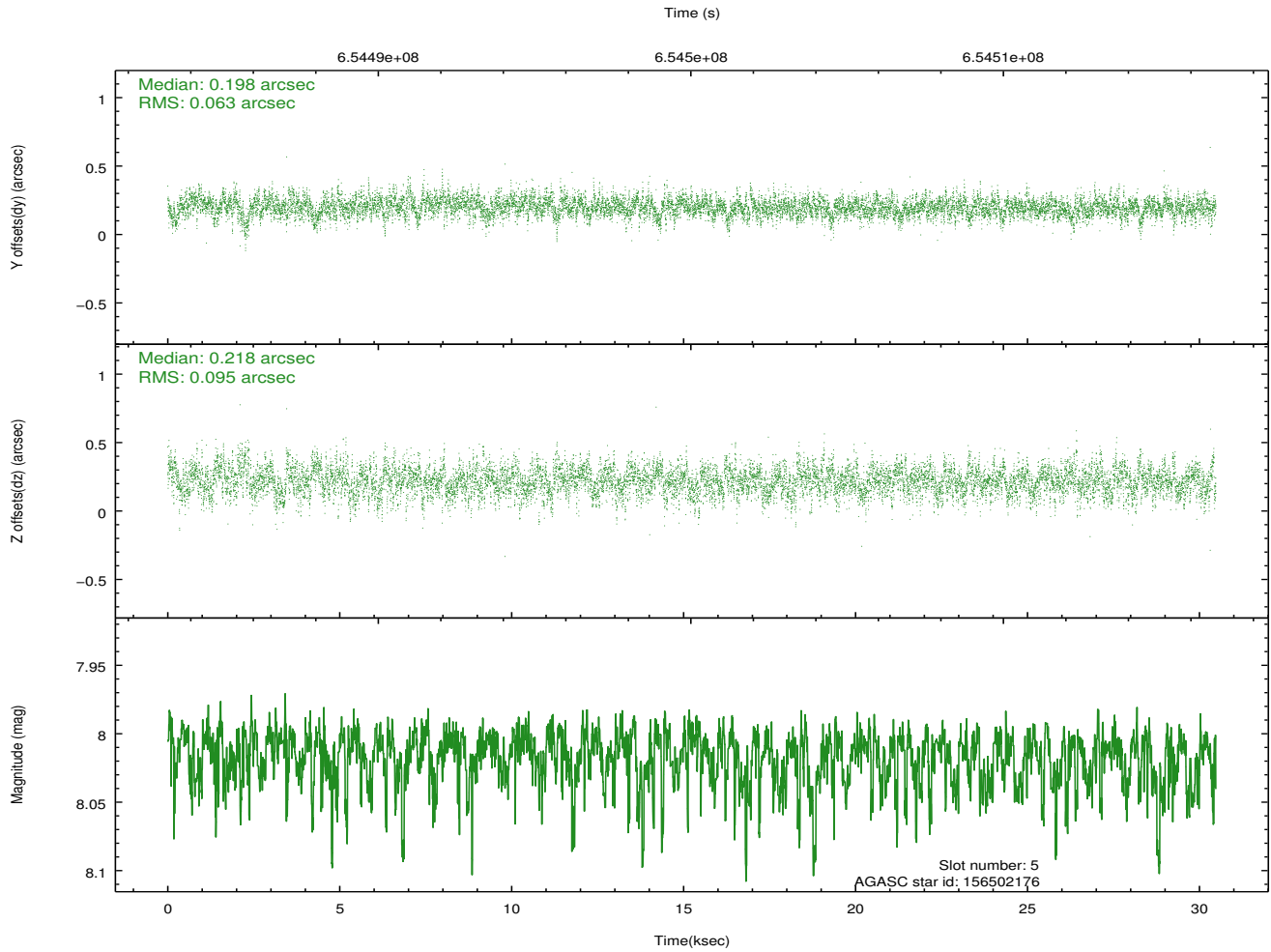
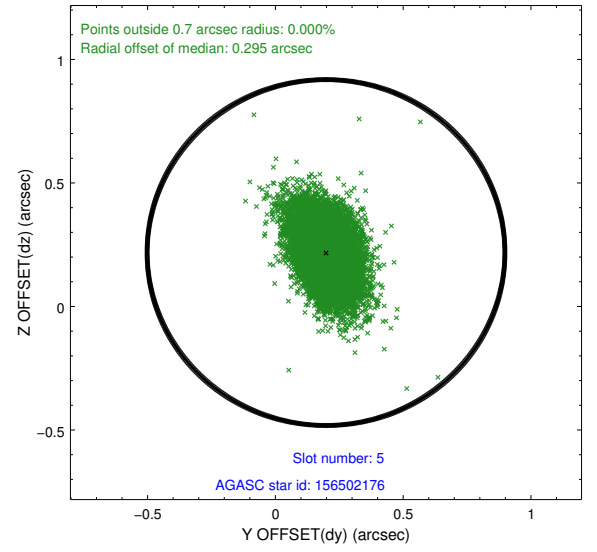
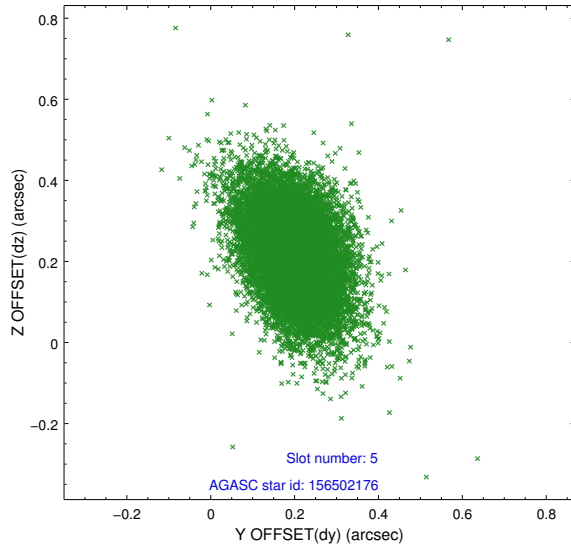
2.4.1 Slot 3



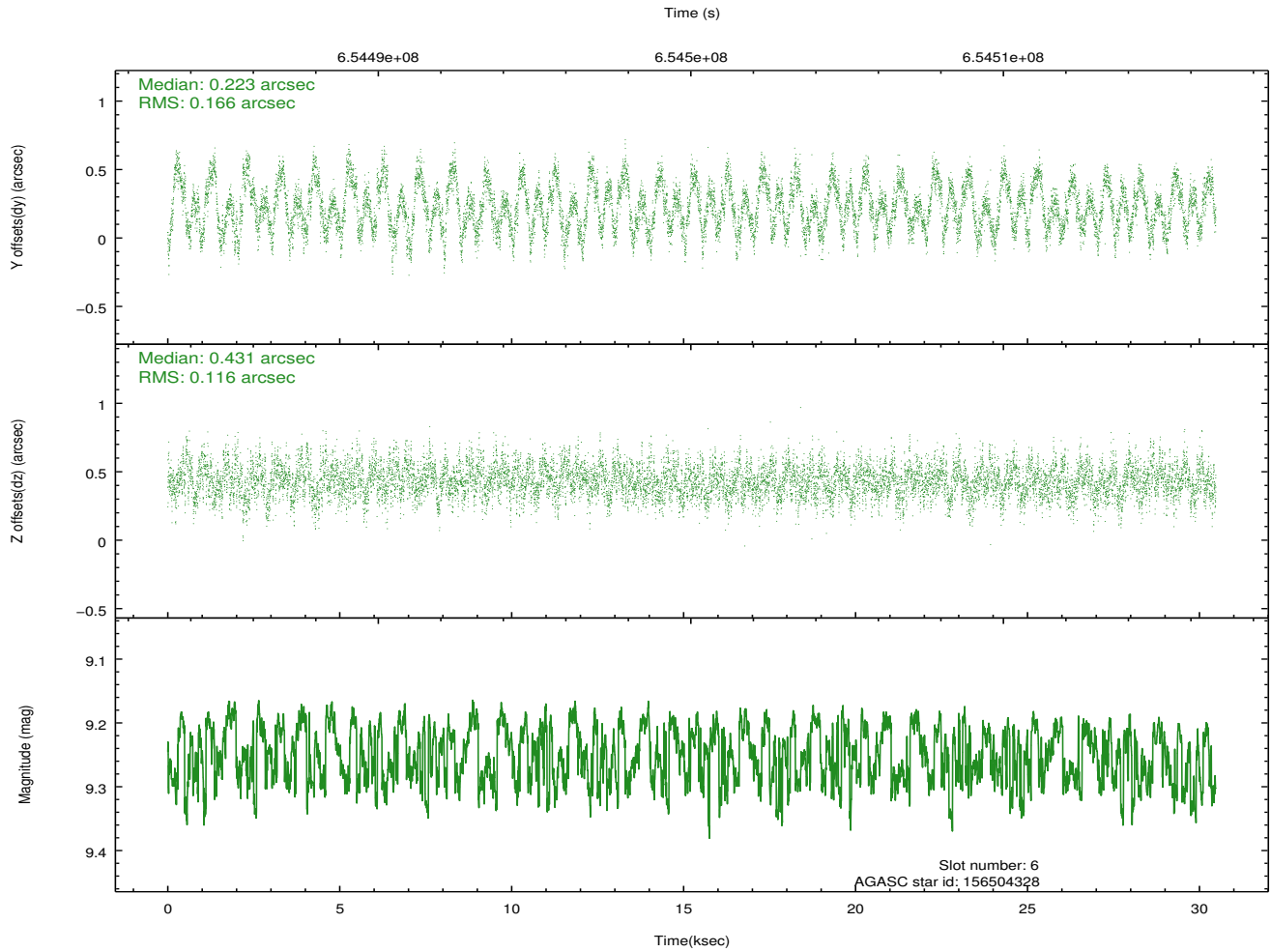
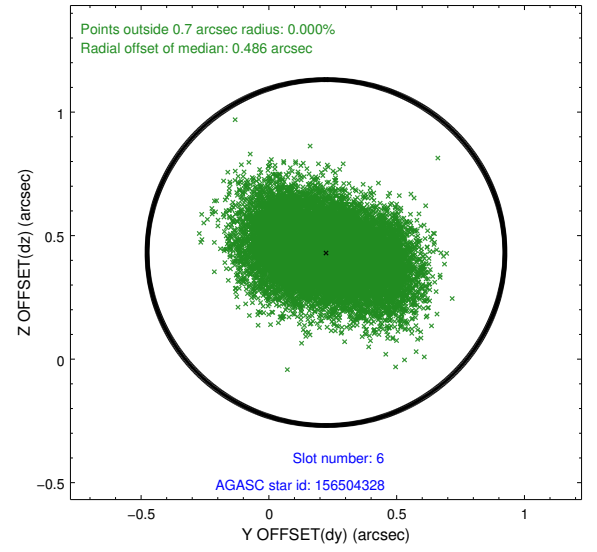
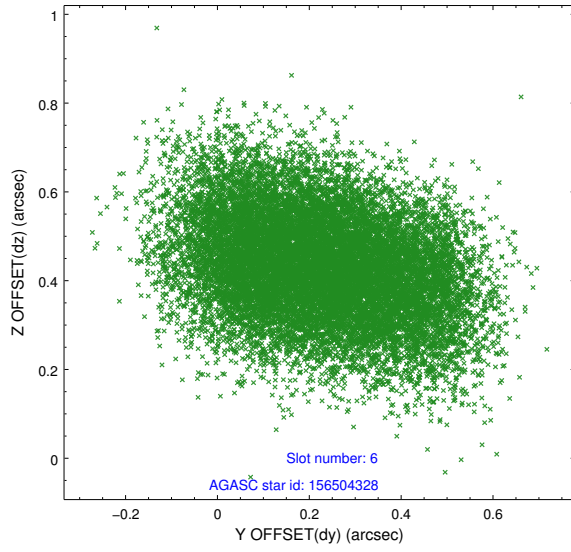
2.4.2 Slot 4



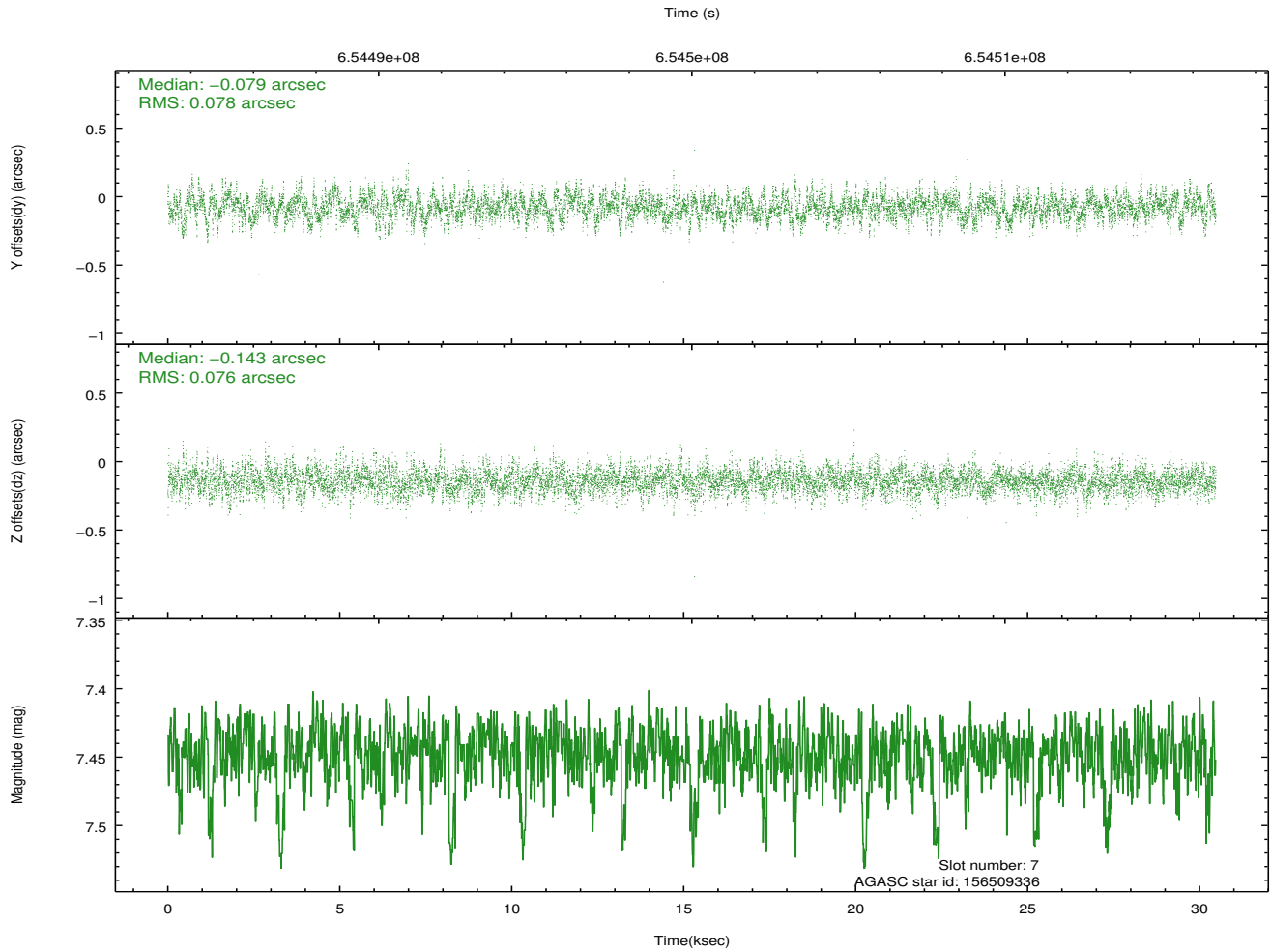
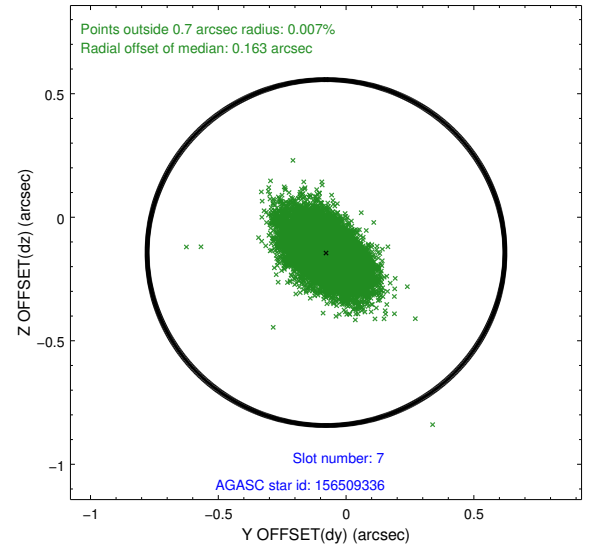
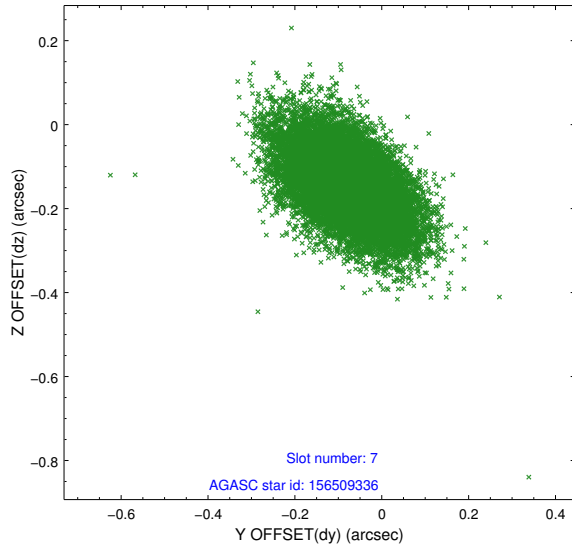
2.4.3 Slot 5



2.4.4 Slot 6

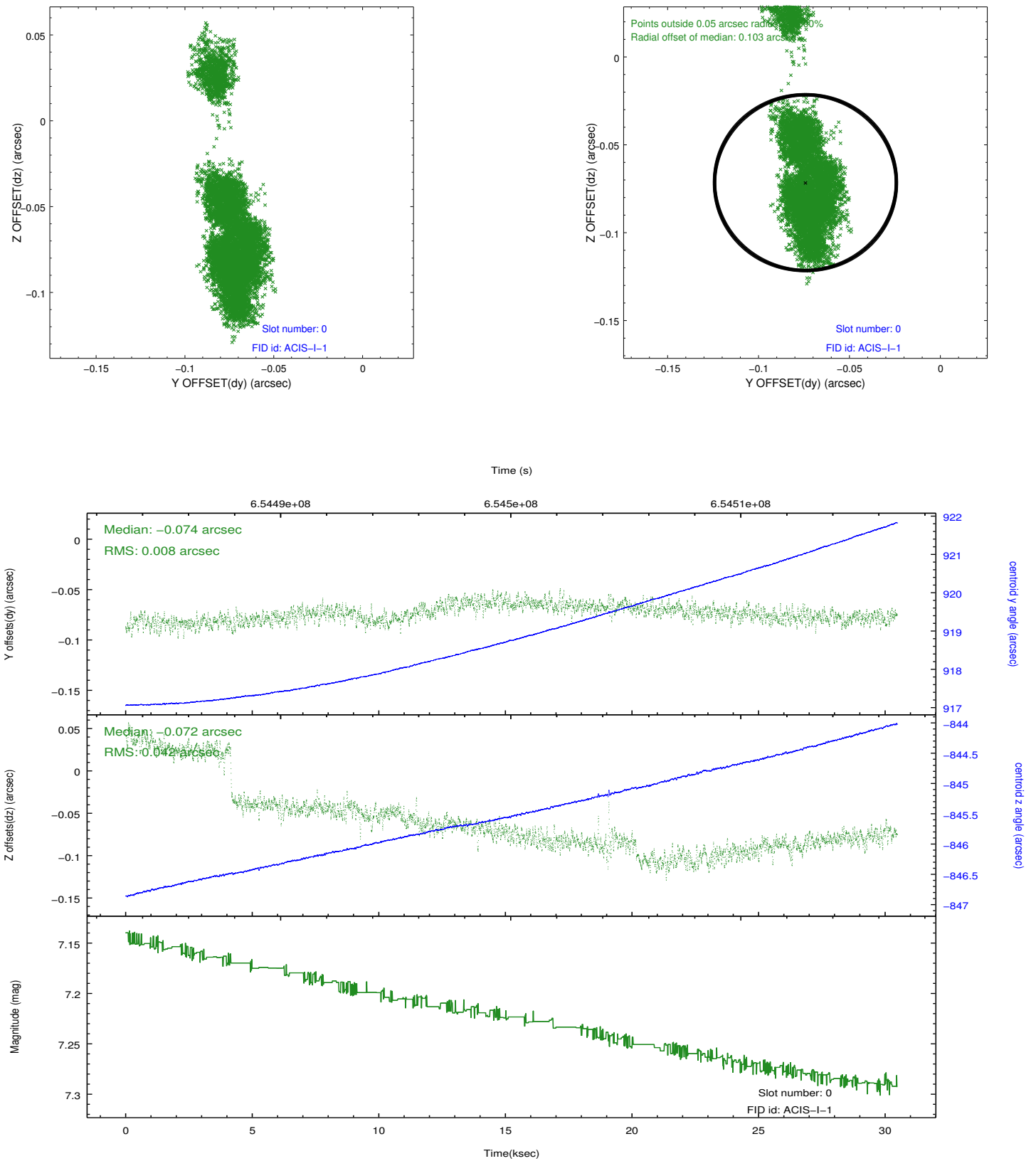


2.4.5 Slot 7

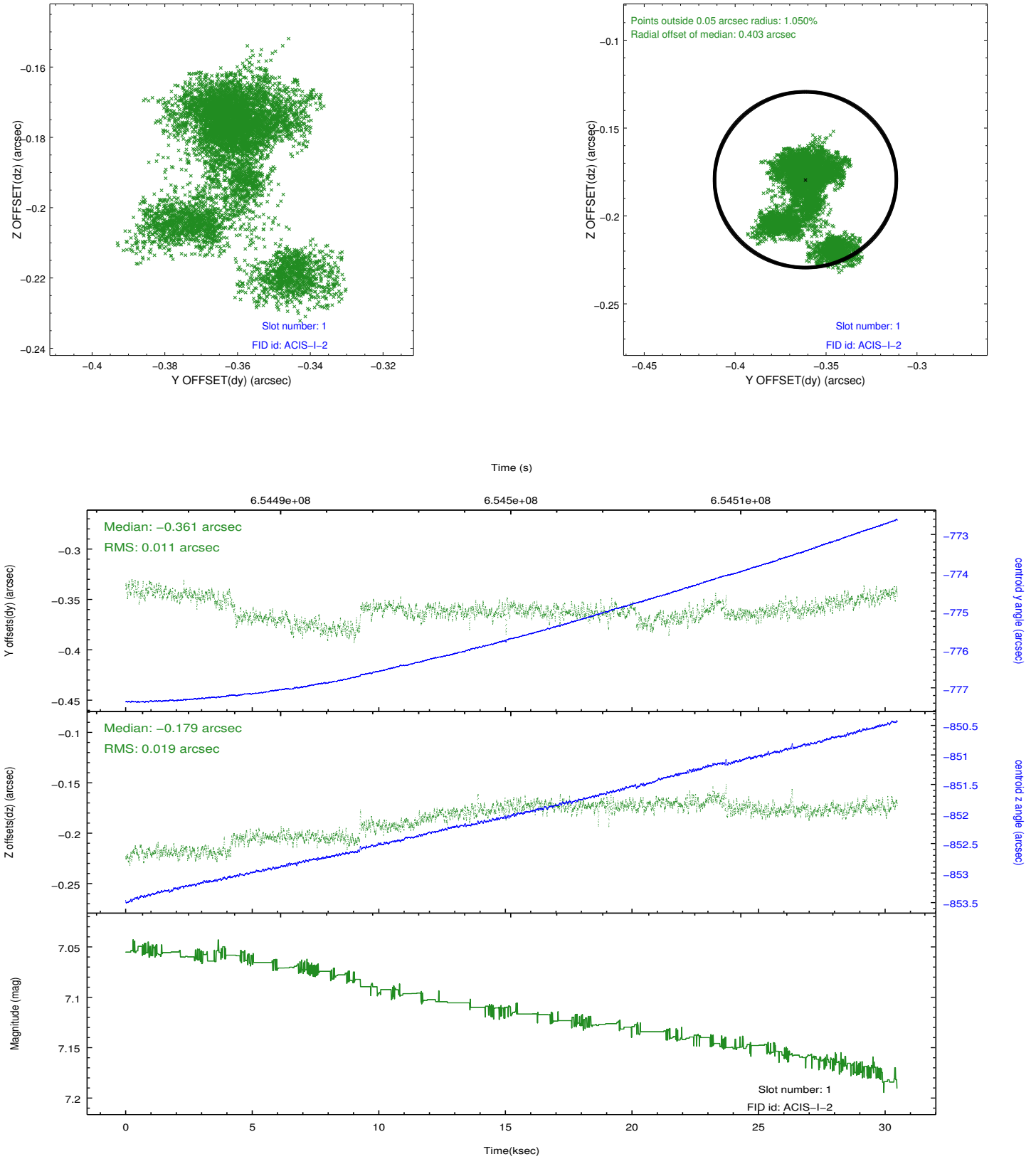


2.5 FID Slots

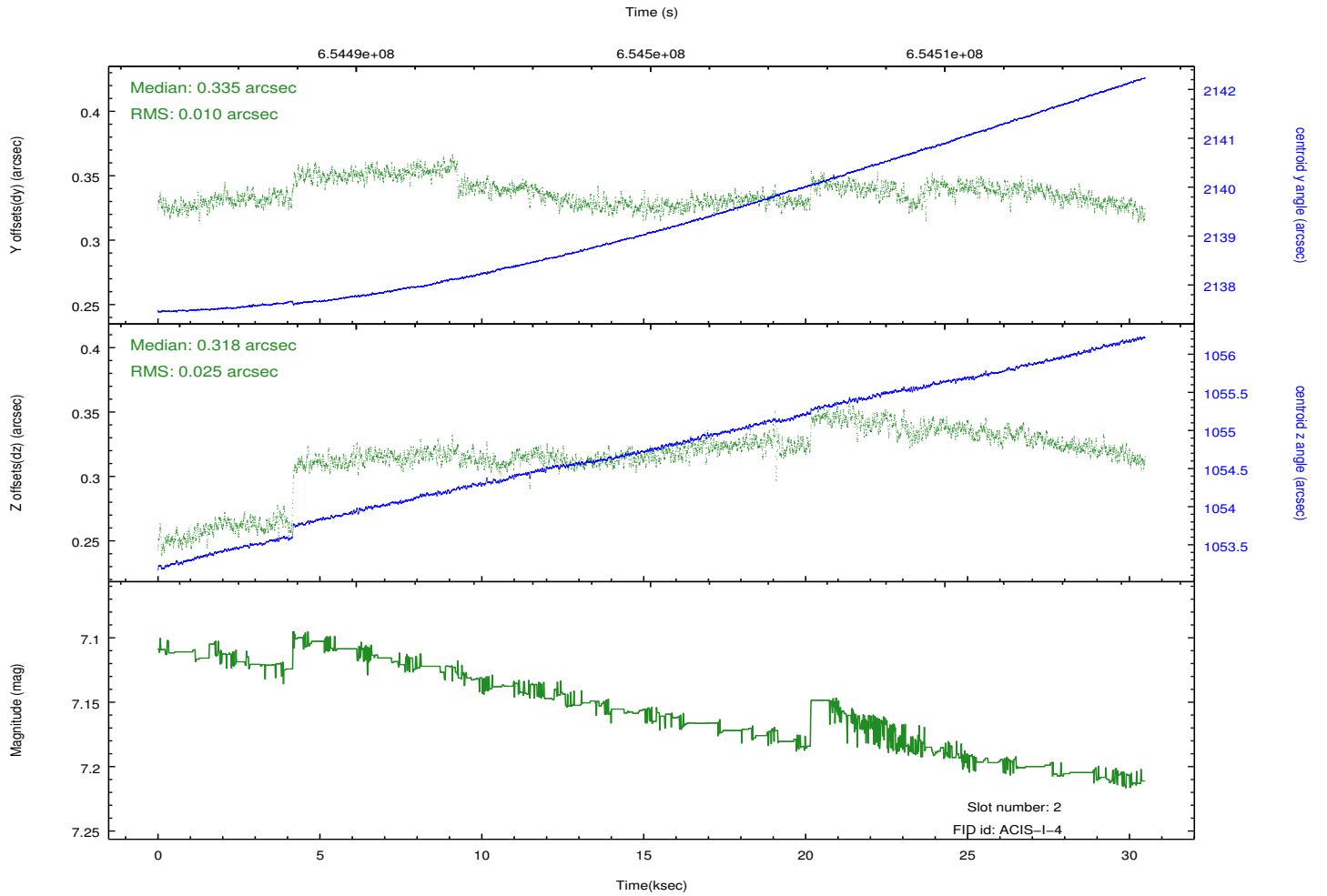
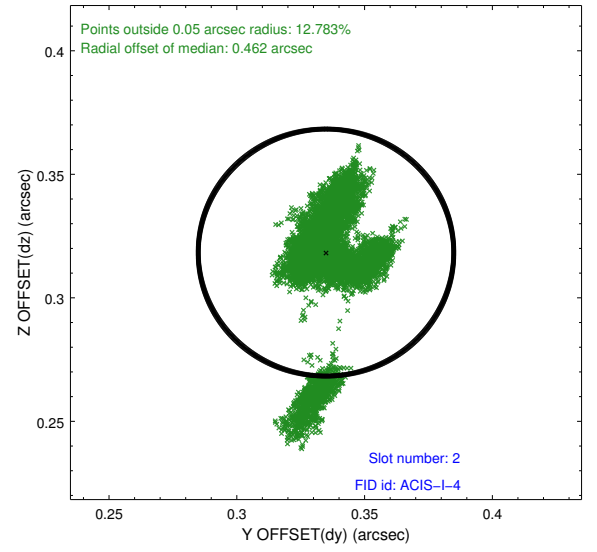
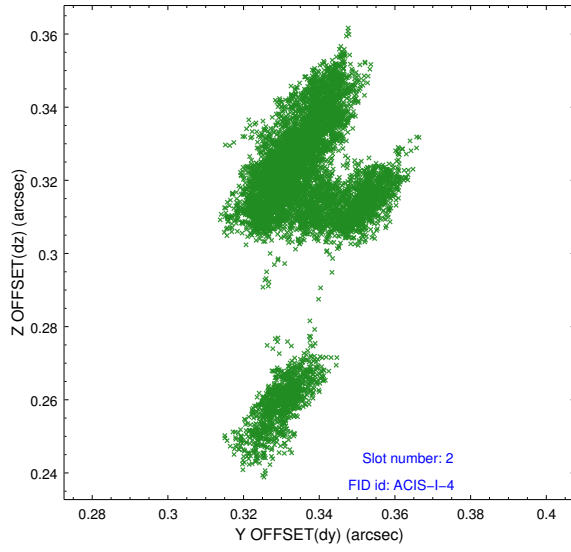
2.5.1 Slot 0



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)	2018.09.28
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	30.074862194777

A.2 Comments

One optional chip was dropped.

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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.