

# V&V Reference Report

## L2 ASCDS Version : 10.6.4

Observation 20749 - L2 Version 1  
Chandra X-Ray Center

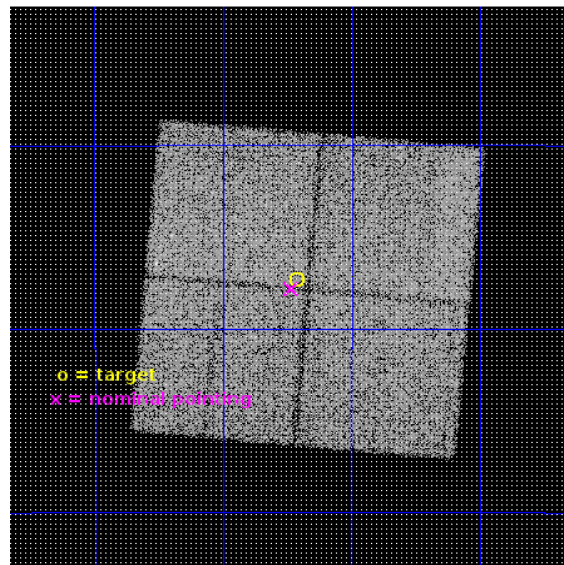
L2 Processing Date : Jul 17 2018

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# 1 Front

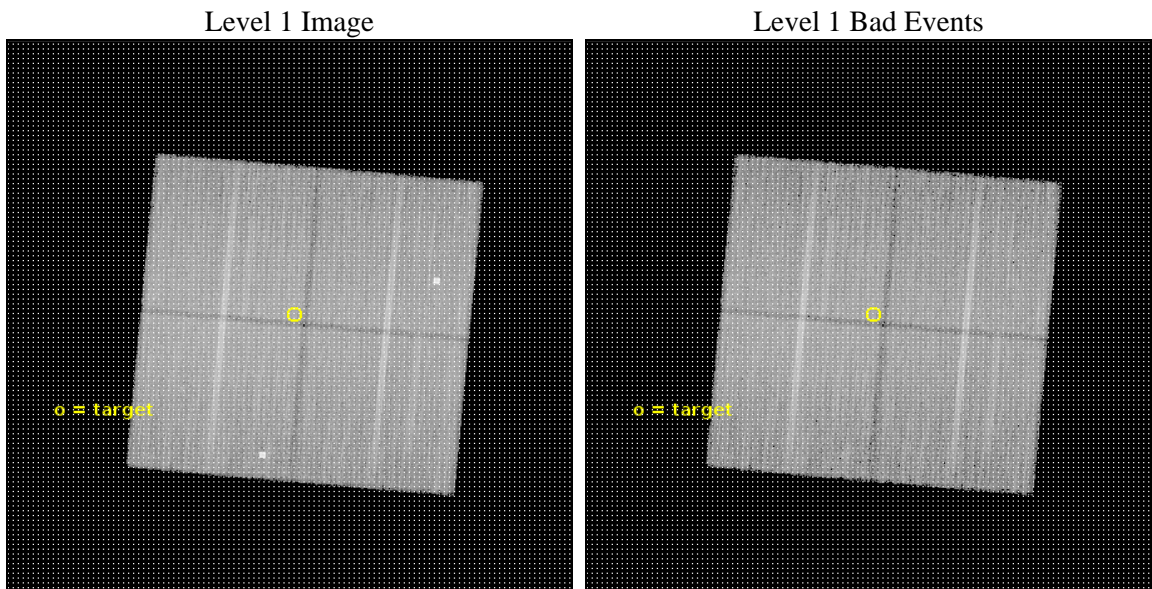
seq_num	601424	Sequence number
obs_id	20749	Observation id
title	Probing MeV-GeV Electrons in the X-ray Regime Using Molecular Cloud Bania's Clump2	Proposal title
observer	Gordon Garmire	Principal investigator
object	Bania Clump 2	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	267.9275	Observer's specified target RA [deg]
dec_targ	-26.288333	Observer's specified target Dec [deg]
ra_nom	267.93353977918	Nominal RA [deg]
dec_nom	-26.296902302069	Nominal Dec [deg]
roll_nom	275.21135865566	Nominal Roll [deg]
revision	1	Processing version of data
ontime	41078.100316048	Sum of GTIs [s]
livetime	40541.384694161	Livetime [s]
ontime0	41078.100316048	Sum of GTIs [s]
ontime1	41078.100316048	Sum of GTIs [s]
ontime2	41078.100316048	Sum of GTIs [s]
ontime3	41078.100316048	Sum of GTIs [s]
l2events	121361	Number of level 2 events



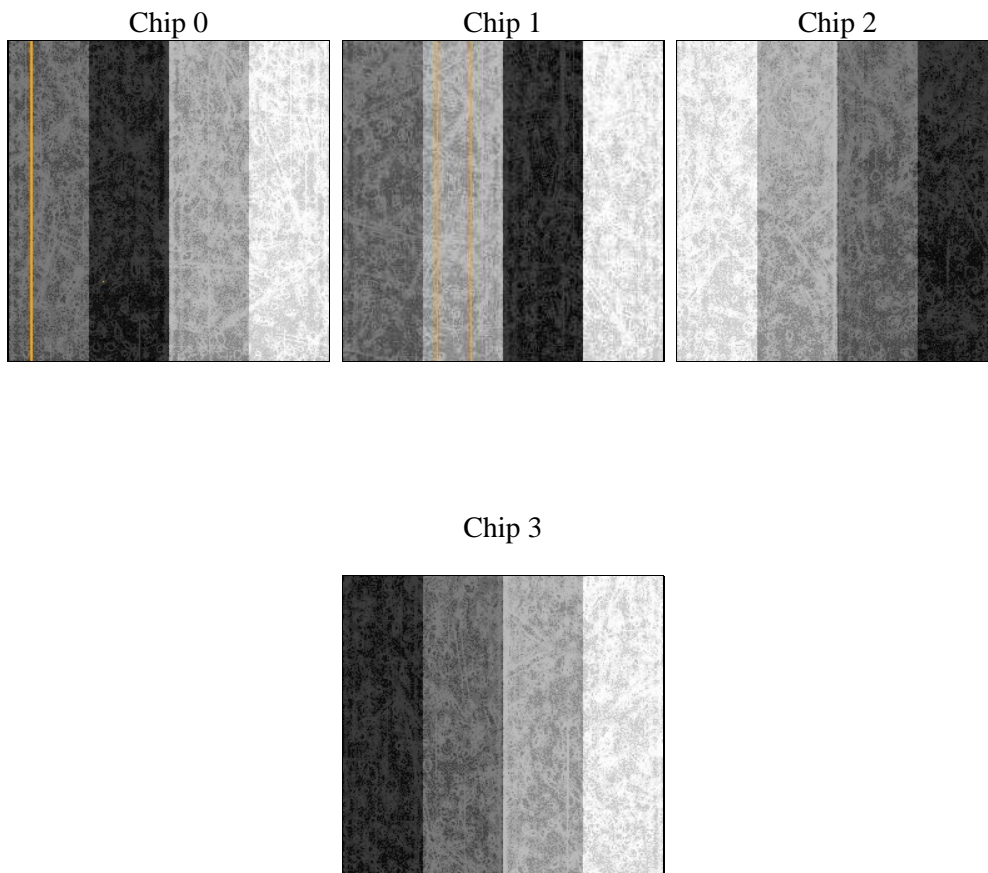
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	41000.000000	[s] Scheduled observation exposure time
ascdsver	10.6.4	Processing system revision	ontime	41078.100316048	Sum of GTIs [s]
caldsver	4.7.8	&#160	ontime0	41078.100316048	Sum of GTIs [s]
date	2018-07-17T07:22:16	Date and time of file creation	ontime1	41078.100316048	Sum of GTIs [s]
revision	1	Processing version of data	ontime2	41078.100316048	Sum of GTIs [s]
			ontime3	41078.100316048	Sum of GTIs [s]
			l1events	1236700	Number of level 1 events

### 2.1.4 Events

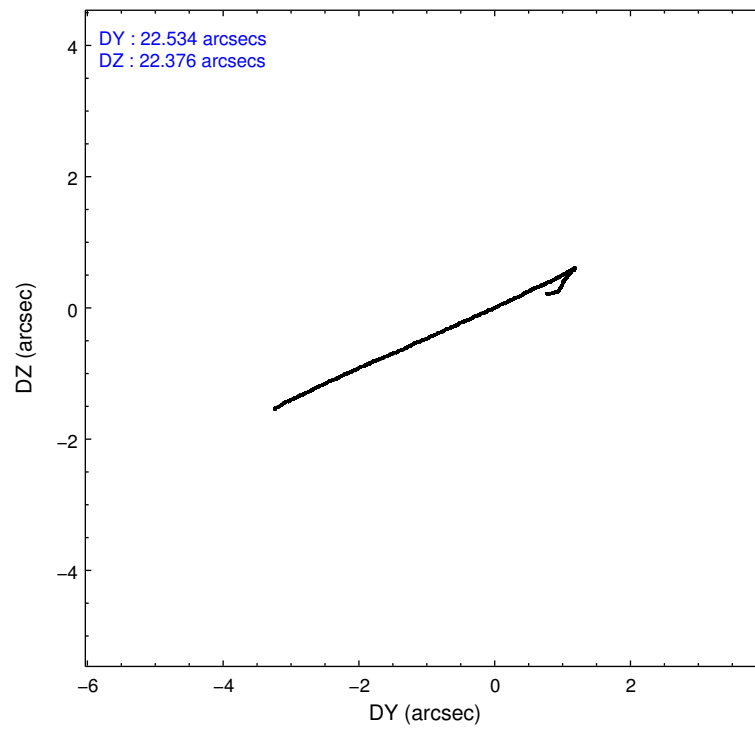
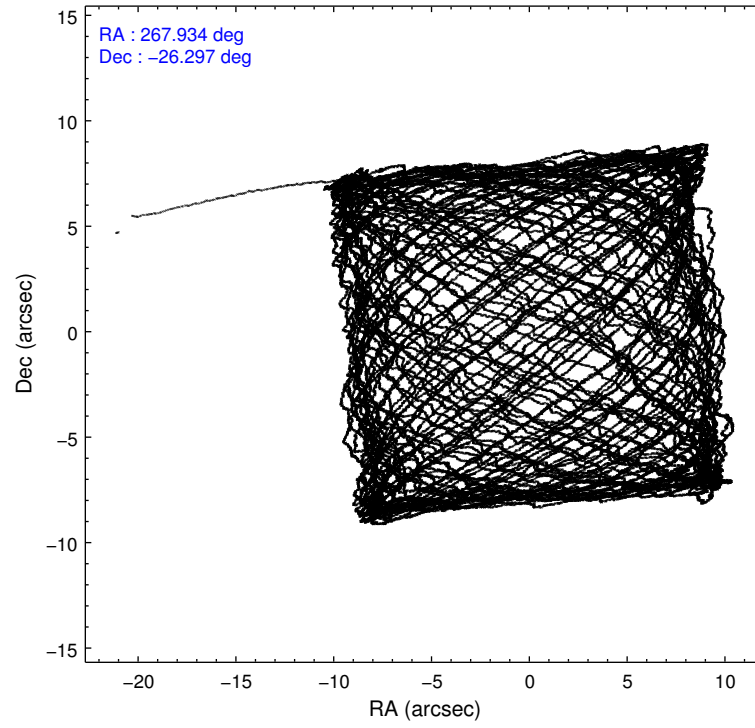
	ccd 0	ccd 1	ccd 2	ccd 3
level 1 events	291022	305005	330045	310628
rejected events	255564	260324	289738	275950
rejected %	87%	85%	87%	88%

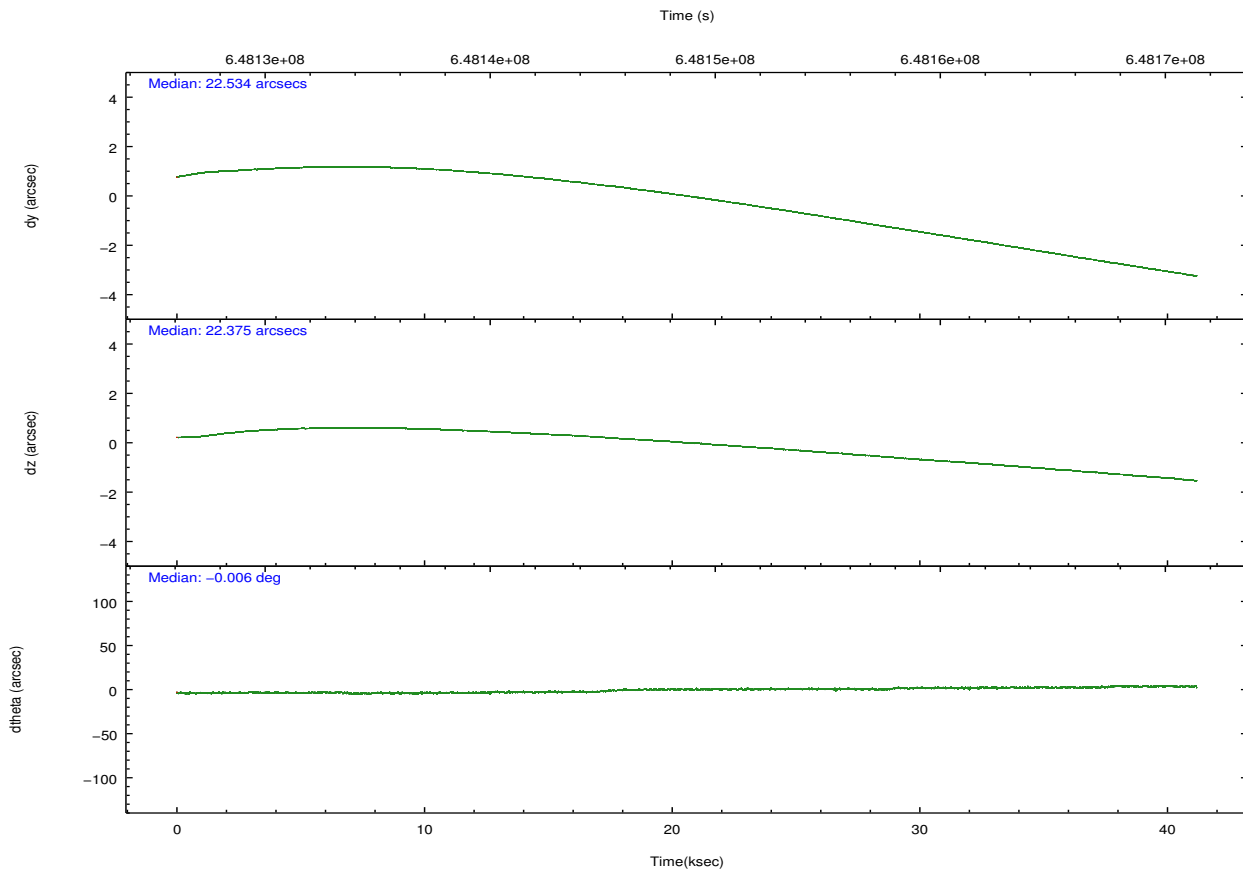
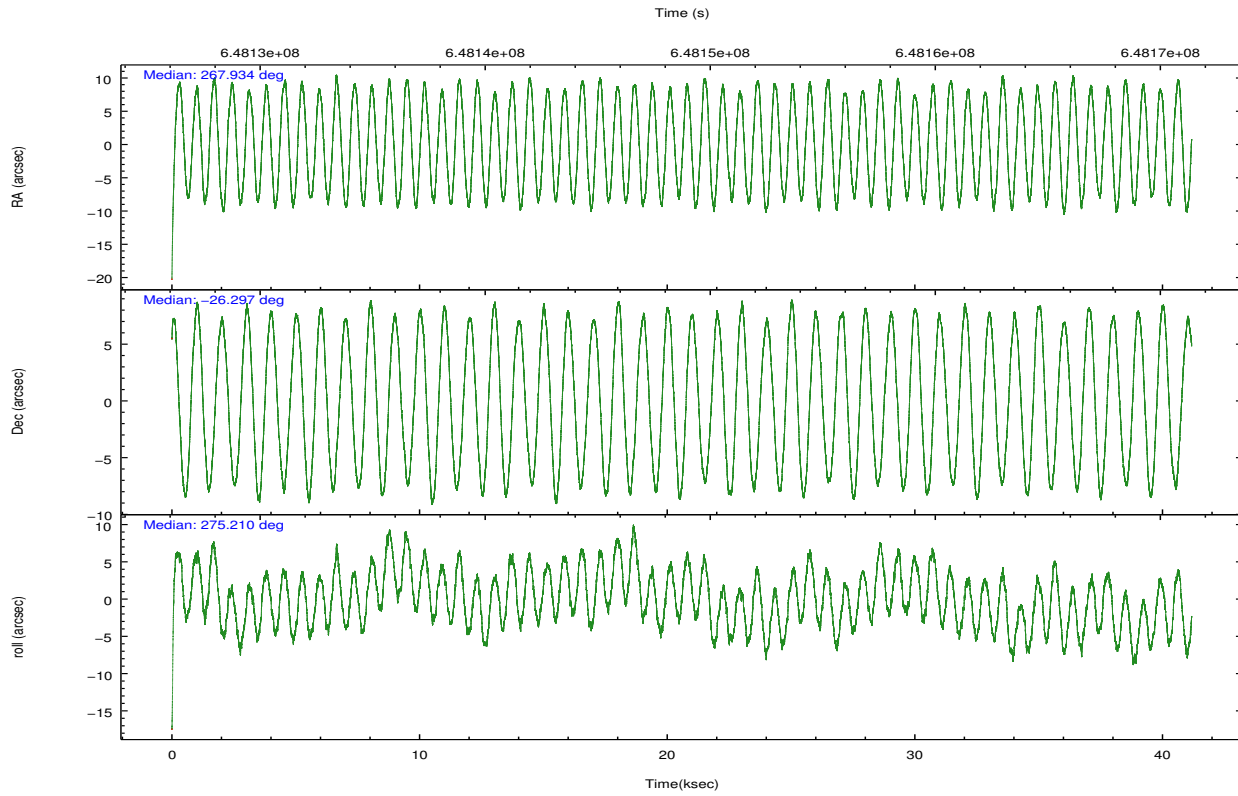
	ccd 0	ccd 1	ccd 2	ccd 3
grade 0 events	12683	18966	18553	12909
	4%	6%	5%	4%
grade 1 events	168	204	212	162
	0%	0%	0%	0%
grade 2 events	8644	9579	8287	7485
	2%	3%	2%	2%
grade 3 events	3465	3621	3381	3538
	1%	1%	1%	1%
grade 4 events	3354	3577	3300	3534
	1%	1%	0%	1%
grade 5 events	12745	13682	12266	14805
	4%	4%	3%	4%
grade 6 events	7317	8943	6795	7216
	2%	2%	2%	2%
grade 7 events	242646	246433	277251	260979
	83%	80%	84%	84%

## 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	FAINT	FAINT	Number of optional ACIS chips dropped	0	0
Observation mode	POINTING	POINTING	On-chip summing requested	N	N
[deg] Pointing RA	267.915708	267.9335397791811	Subarray requested	NONE	NONE
[deg] Pointing Dec	-26.274415	-26.29690230206878	Alternating exposures requested	N	N
[deg] Pointing Roll	274.994780	275.2113586556632	[s] Primary exposure time	0.000000	3.1
[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)	648128350.184000	648127460.9414999			
Observation start date	2018-07-16T11:38:01	2018-07-16T11:24:20			
[s] Observation end time (MET)	648169350.184000	648170395.63155			
Observation end date	2018-07-16T23:01:21	2018-07-16T23:19:55			
Read mode	TIMED	TIMED			

## 2.3 Aspect





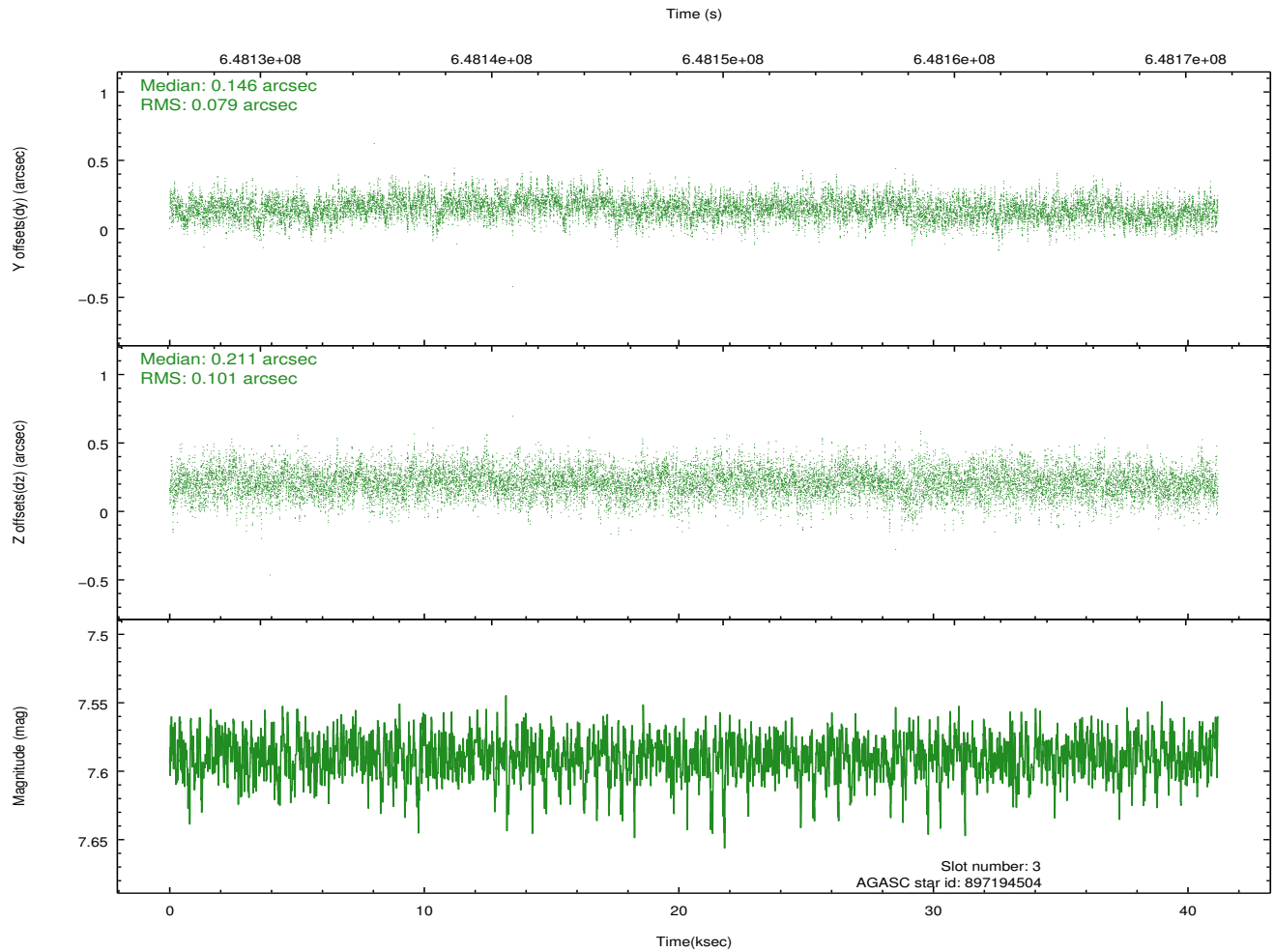
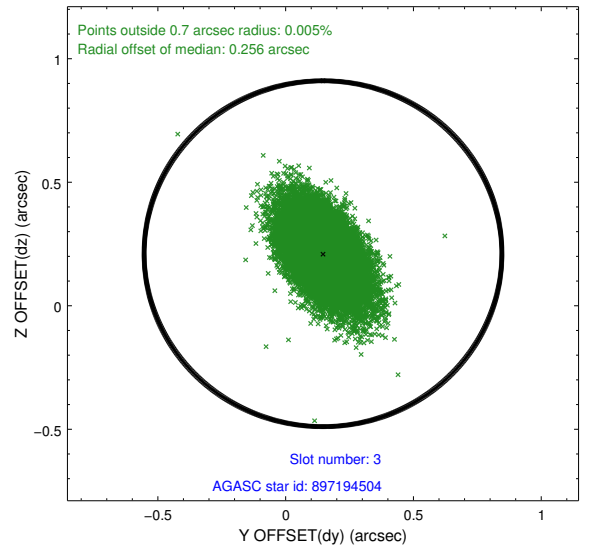
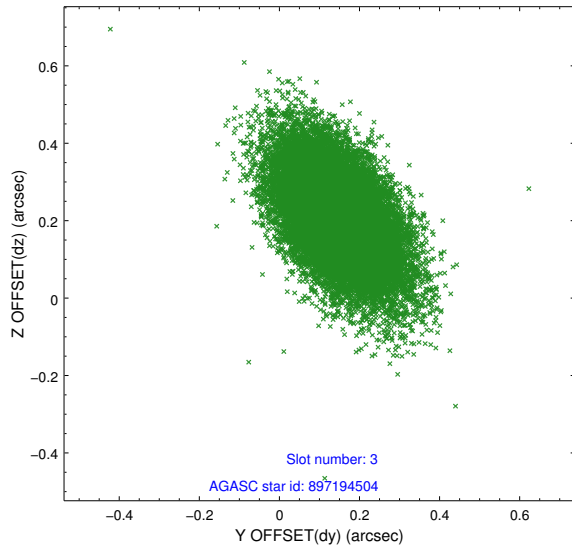
### Slot Statistics

slot	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mea
0	FID		ACIS-I-1	7.20	10044	1.000	0.081	-0.036	0.047	0.062	0.000000	0.000000	917.25	-845
1	FID		ACIS-I-5	7.17	10044	1.000	-0.434	0.018	0.015	0.024	0.000000	0.000000	-1831.51	1051
2	FID		ACIS-I-6	7.20	10043	1.000	0.265	0.086	0.037	0.068	0.000000	0.000000	382.77	1696
3	GUIDE	used	897194504	7.59	20085	1.000	0.146	0.211	0.132	0.232	267.979415	-25.772977	-1779.60	363
4	GUIDE	used	897717296	8.24	20078	1.000	0.144	0.241	0.144	0.247	267.921819	-26.875322	2157.30	-168
5	GUIDE	used	897717824	8.38	20073	1.000	-0.239	-0.189	0.135	0.241	268.549726	-26.822099	2146.66	1856
6	GUIDE	used	897721184	8.51	20073	1.000	-0.157	-0.175	0.156	0.269	268.625317	-26.632090	1490.58	2161
7	GUIDE	used	897722680	8.82	20060	1.000	0.108	-0.088	0.191	0.307	268.059296	-26.906681	2308.34	261

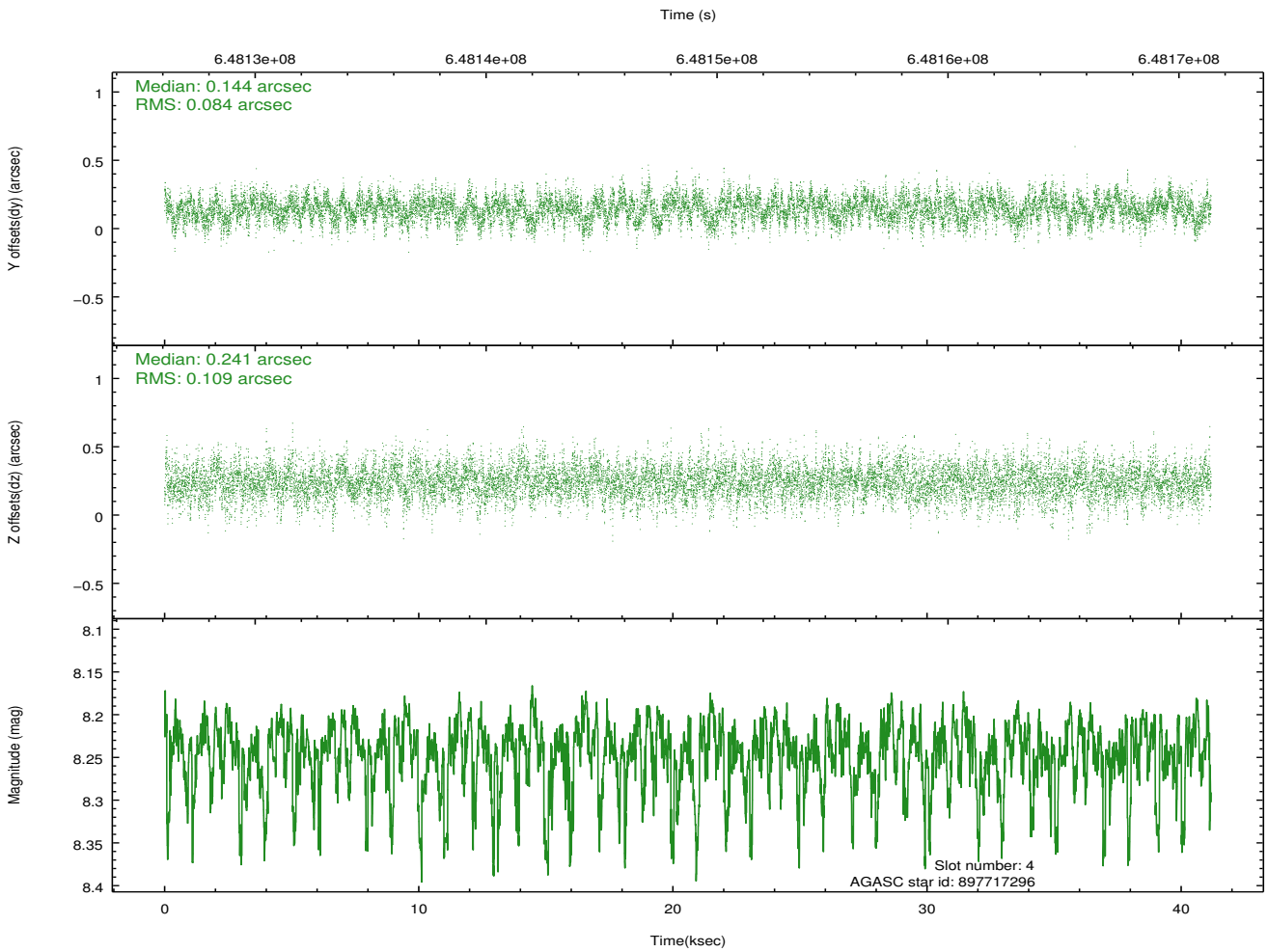
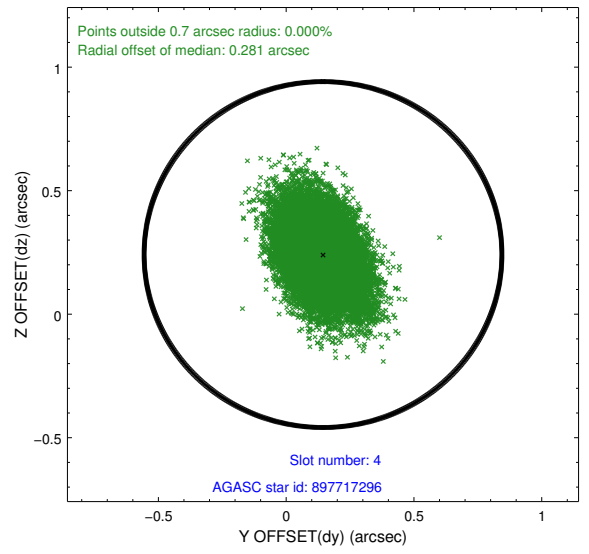
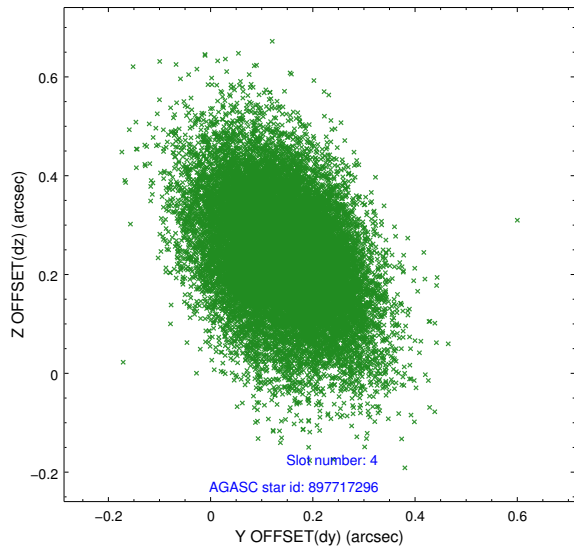
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## 2.4 Star Slots

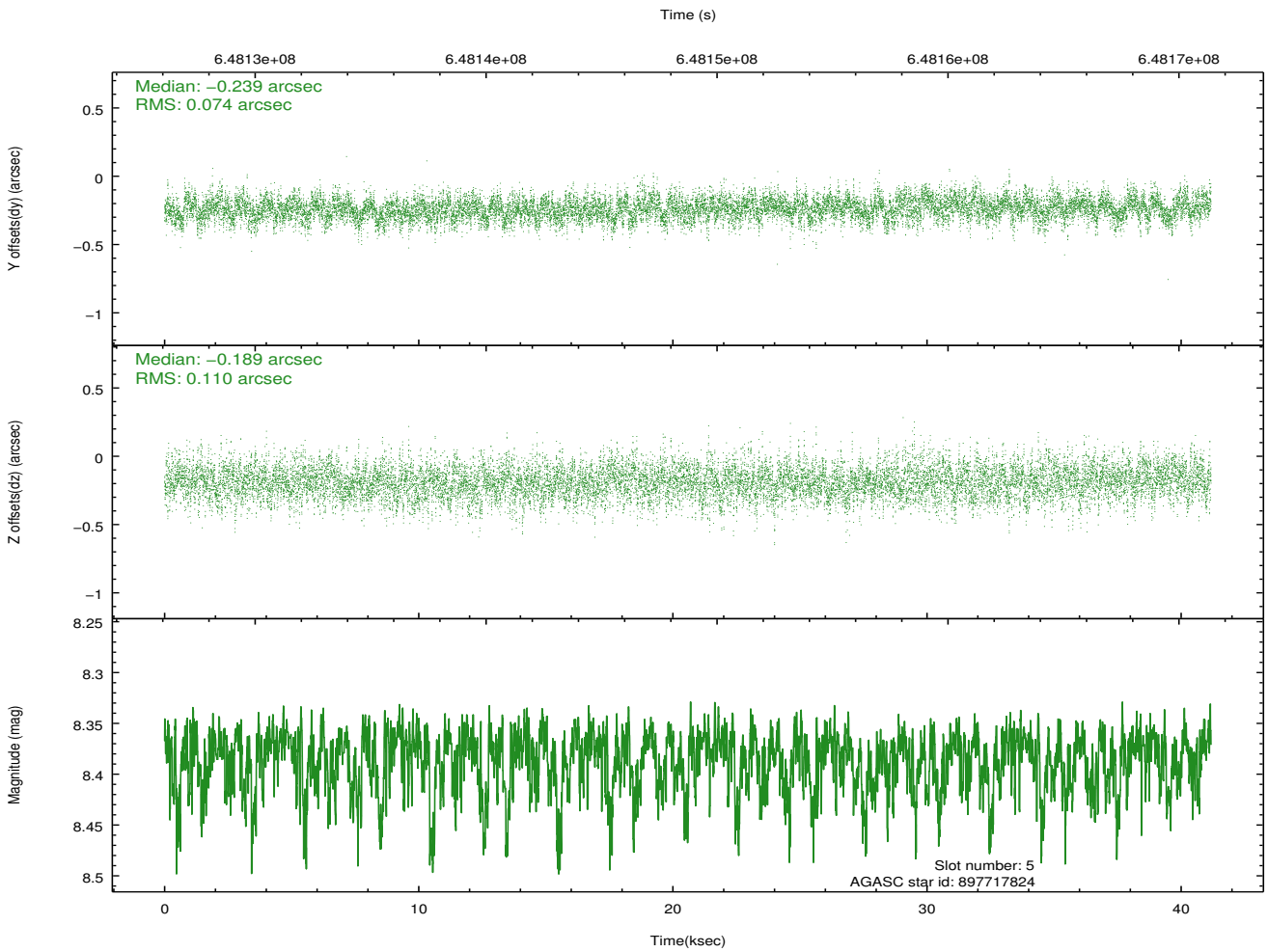
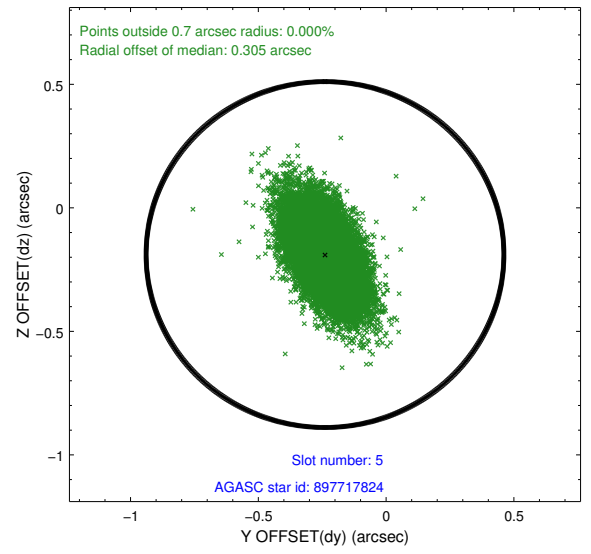
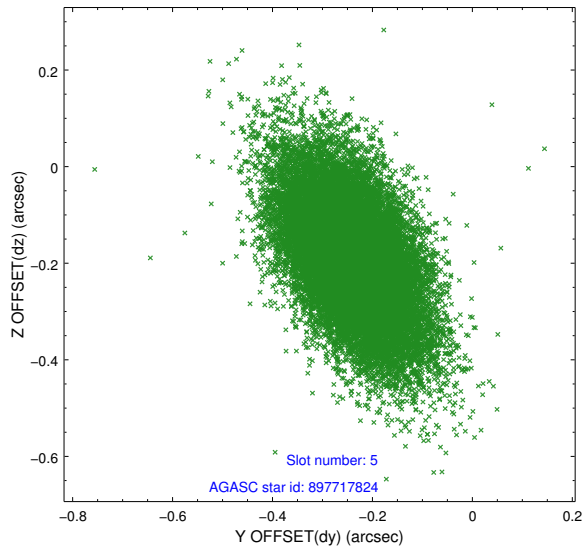
### 2.4.1 Slot 3



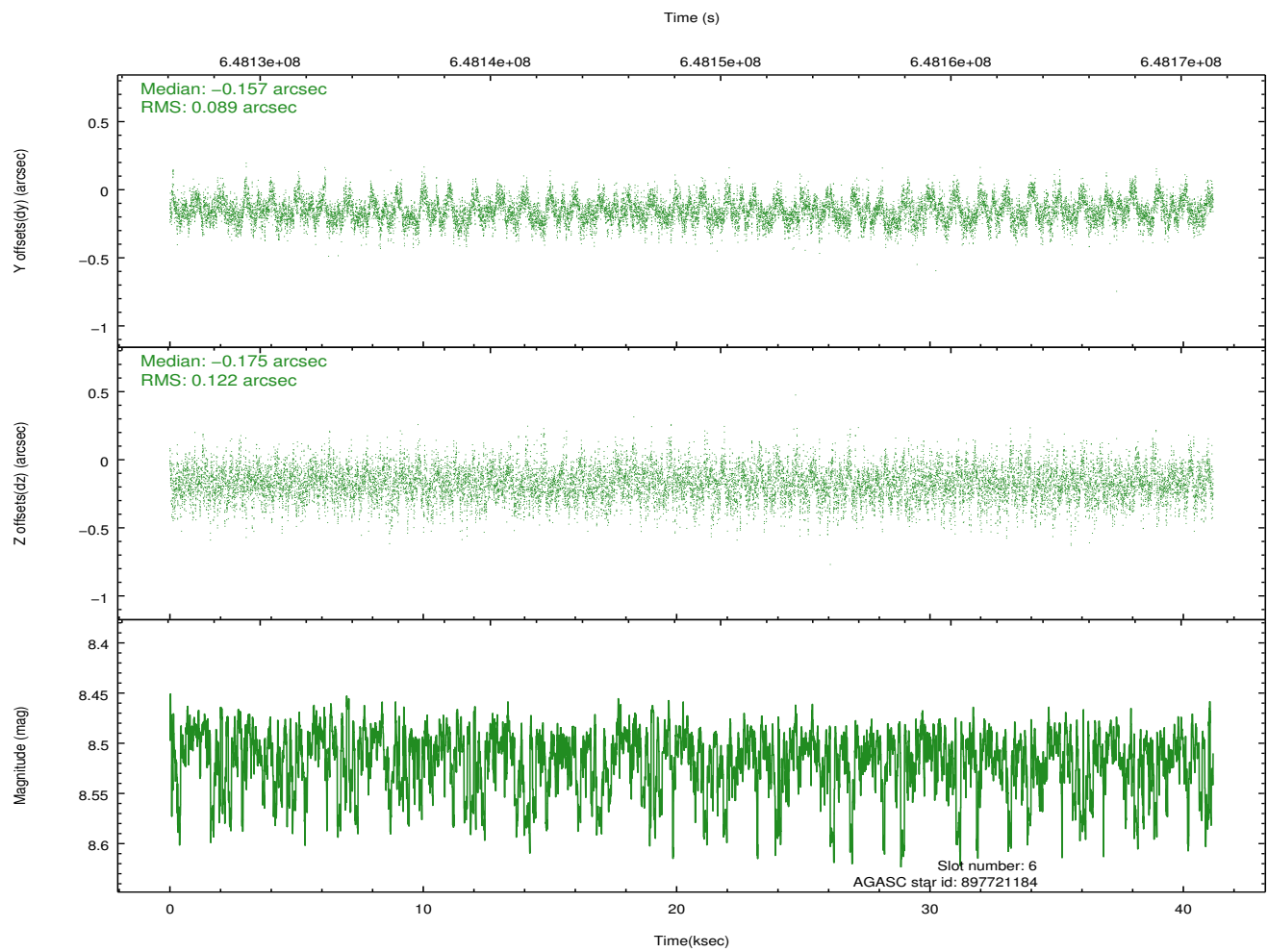
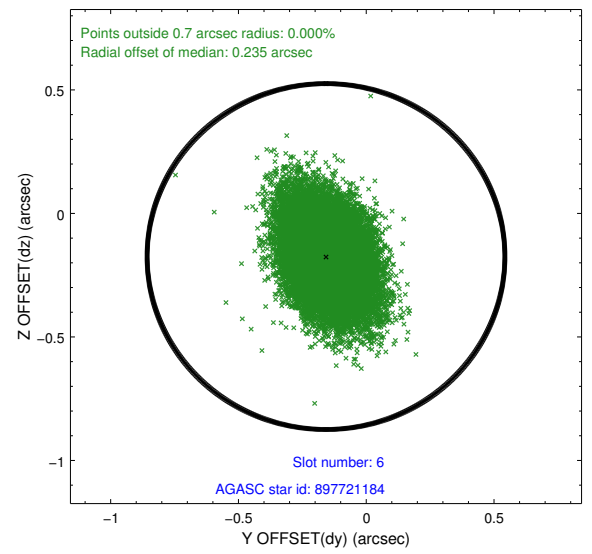
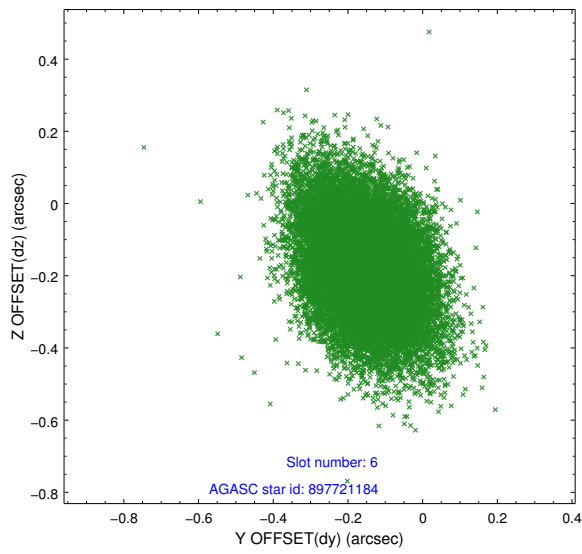
### 2.4.2 Slot 4



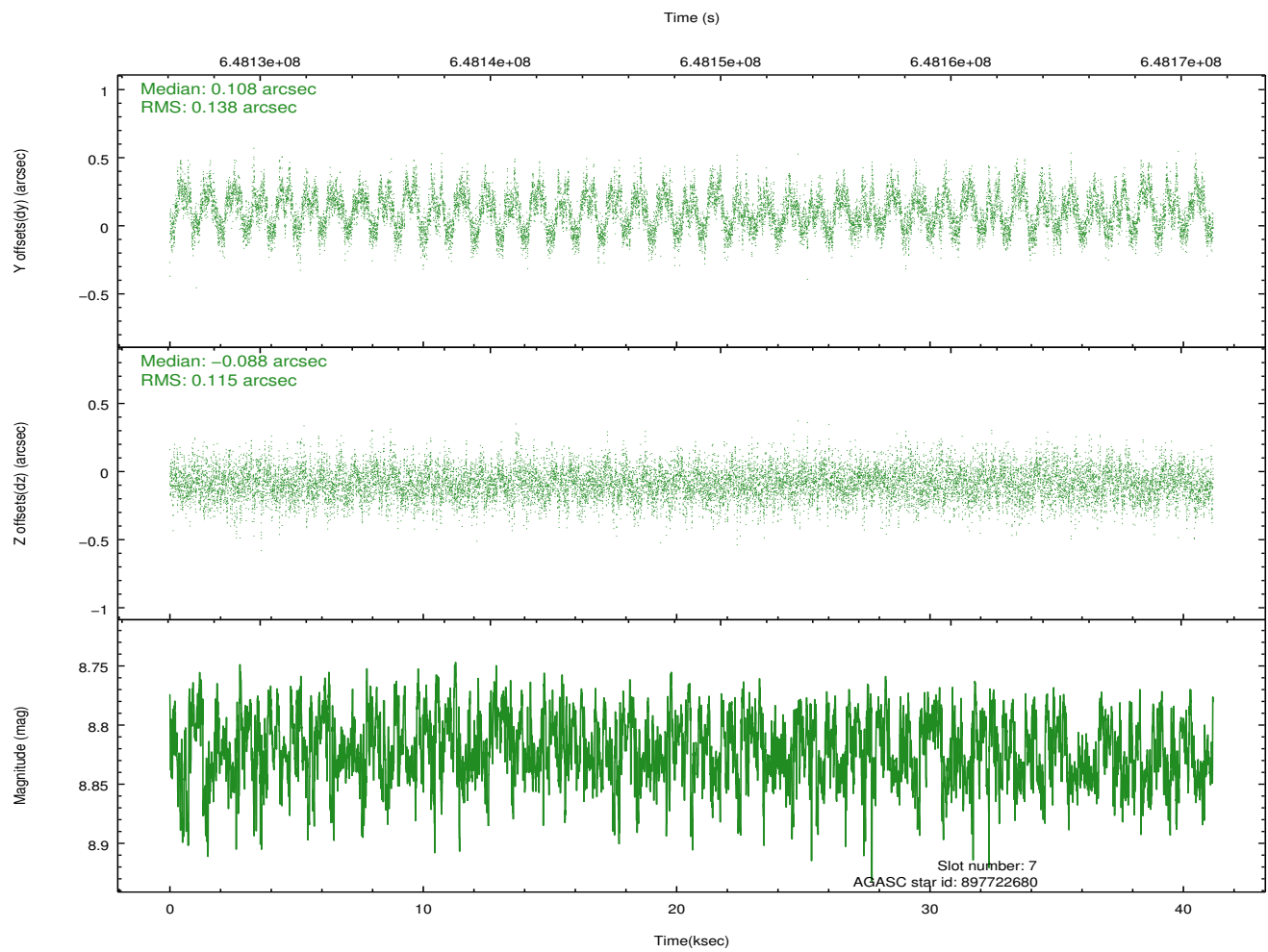
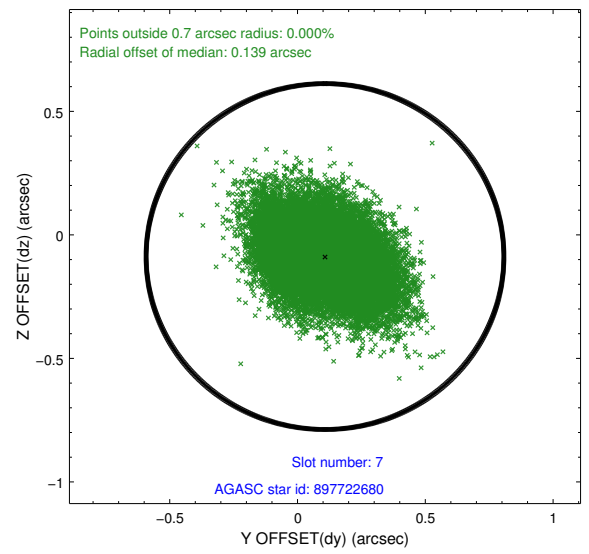
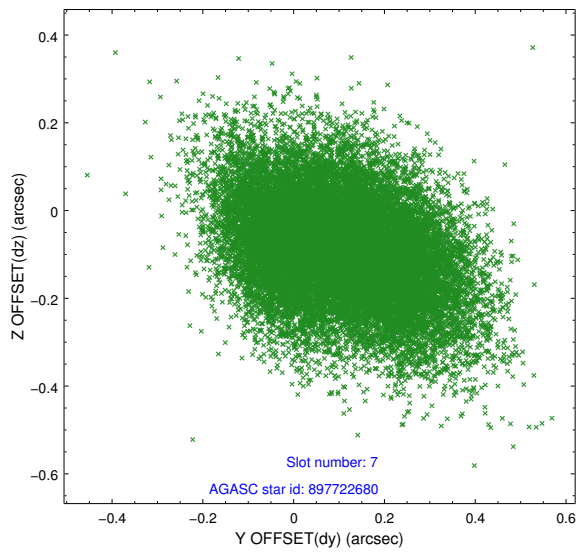
### 2.4.3 Slot 5



## 2.4.4 Slot 6

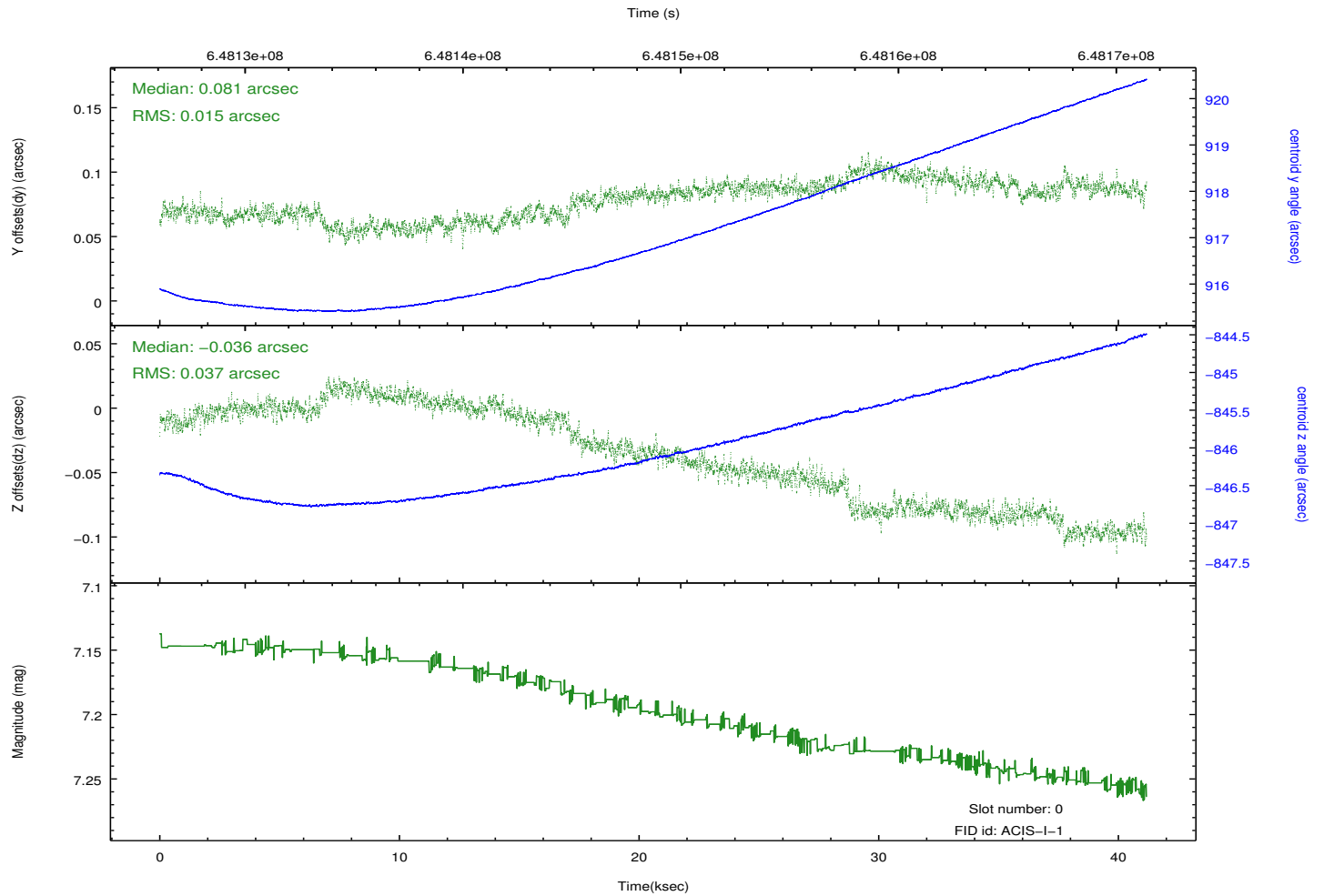
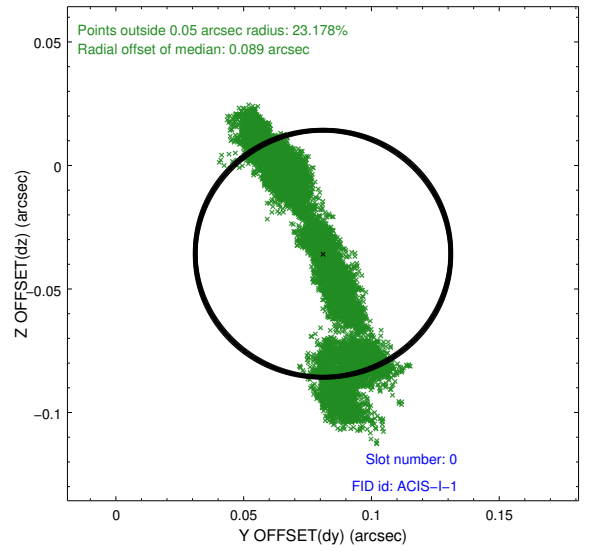
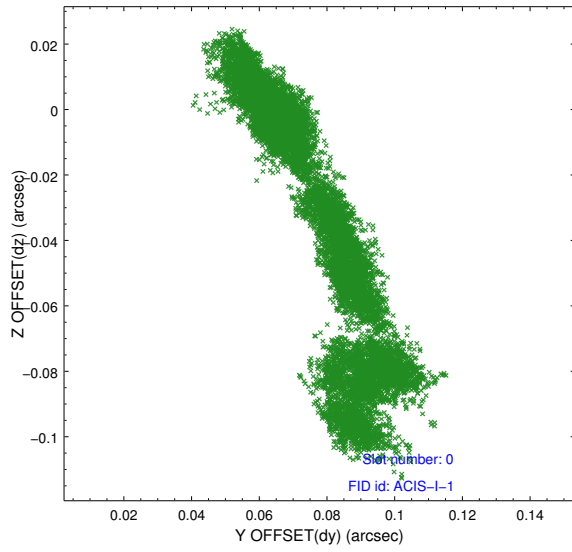


## 2.4.5 Slot 7

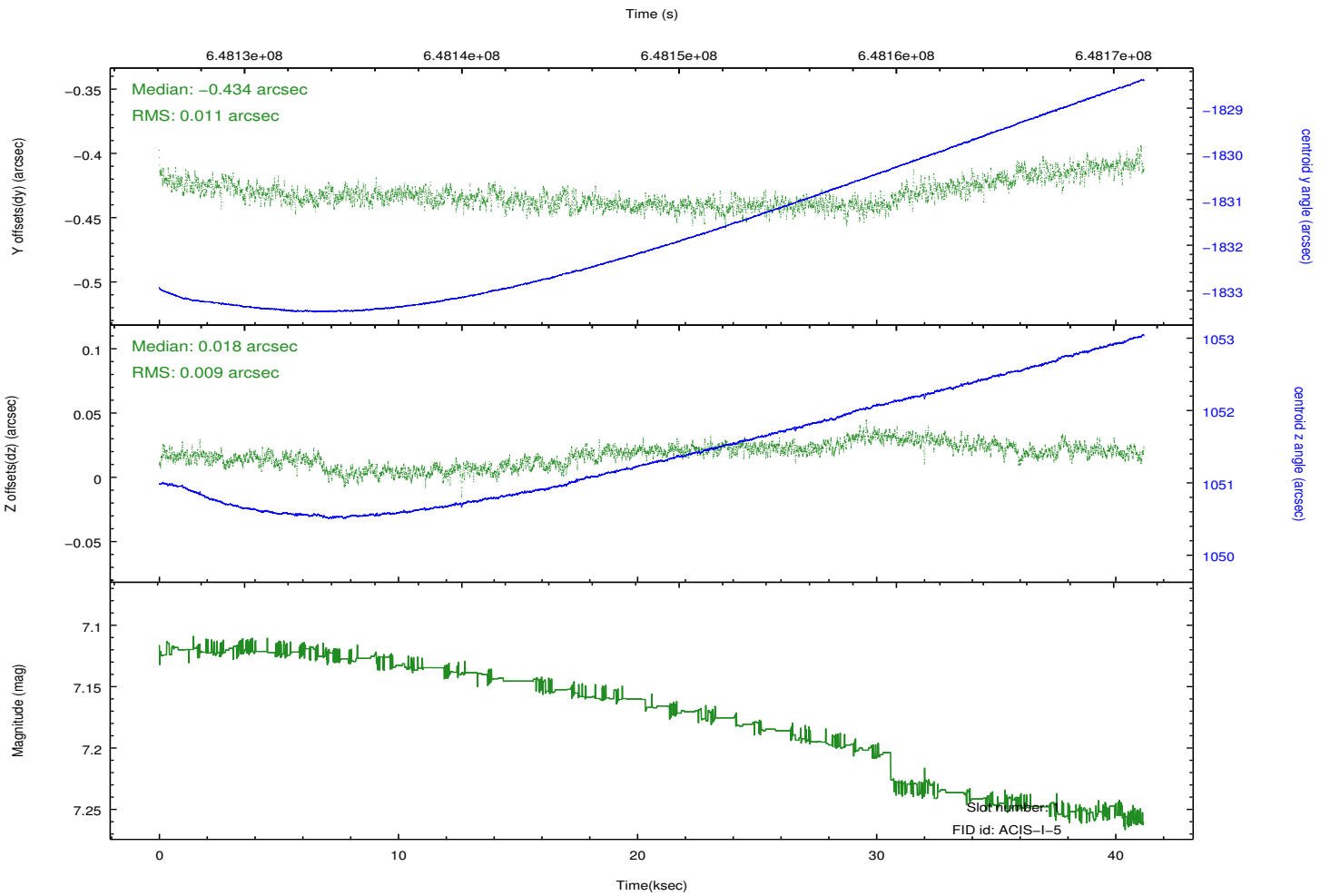
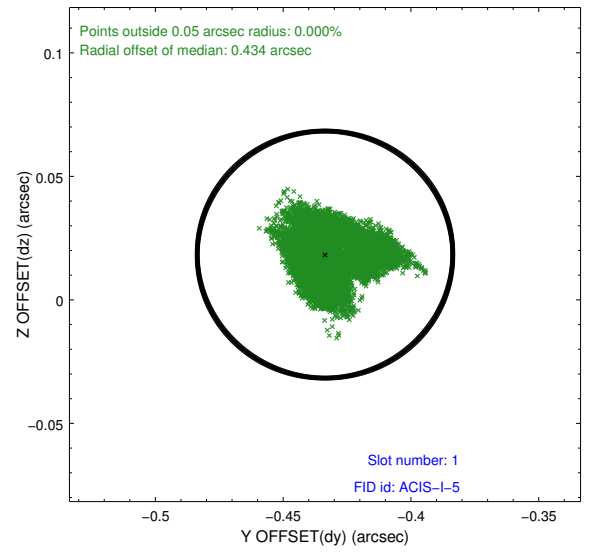
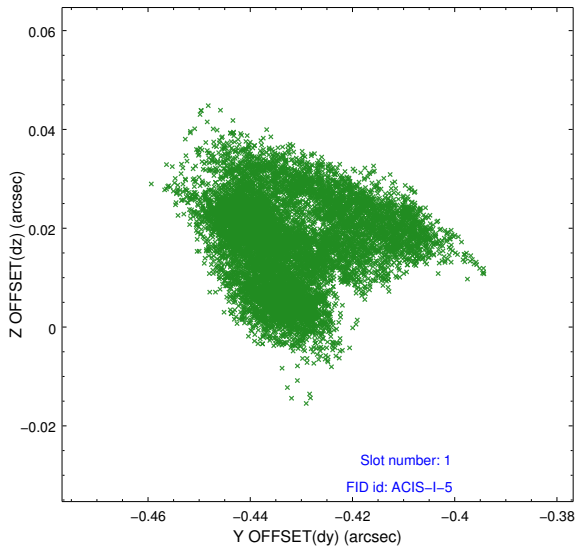


## 2.5 FID Slots

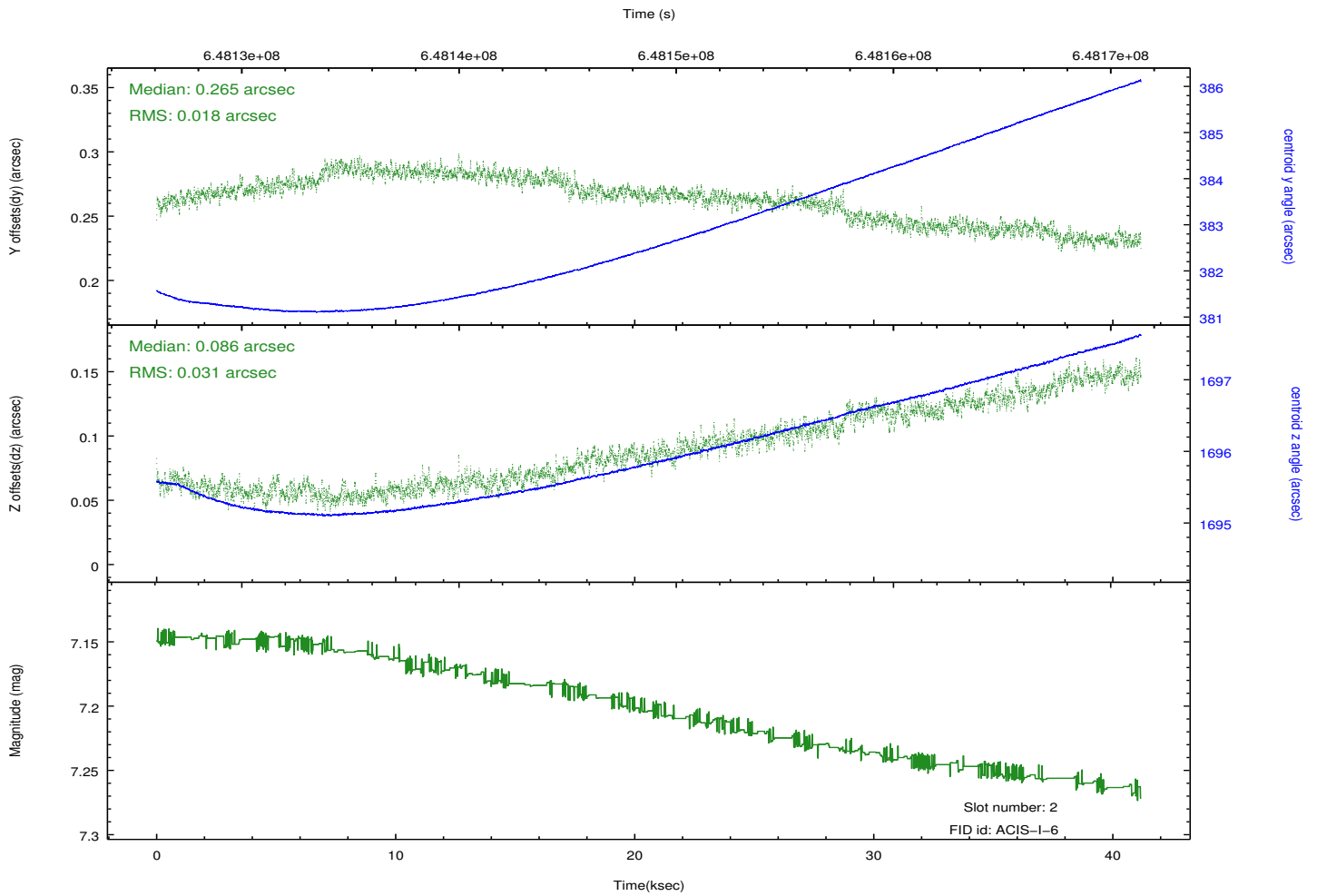
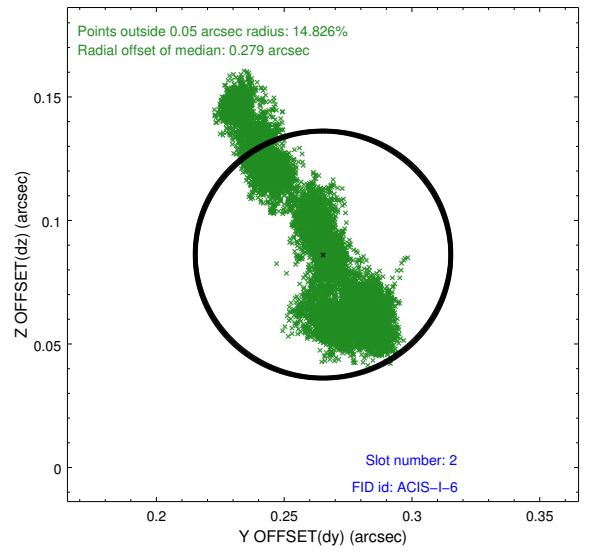
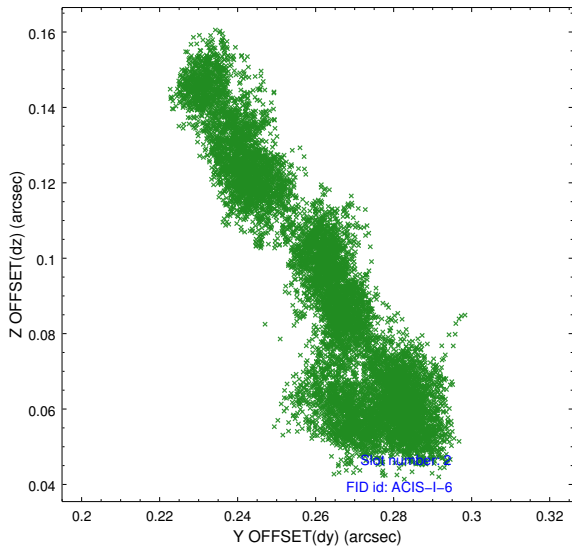
### 2.5.1 Slot 0



## 2.5.2 Slot 1



### 2.5.3 Slot 2



# A Summary

## A.1 Status

V&V Scientist	Jen Lauer
V&V Date (YYYY-MM-DD)	2018.07.17
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	41.078100316048

## A.2 Comments

The focal plane temperature during the final ~4 ksec 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](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.