

# V&V Reference Report

## L2 ASCDS Version : 8.4.5

Observation 1776 - L2 Version 5  
Chandra X-Ray Center

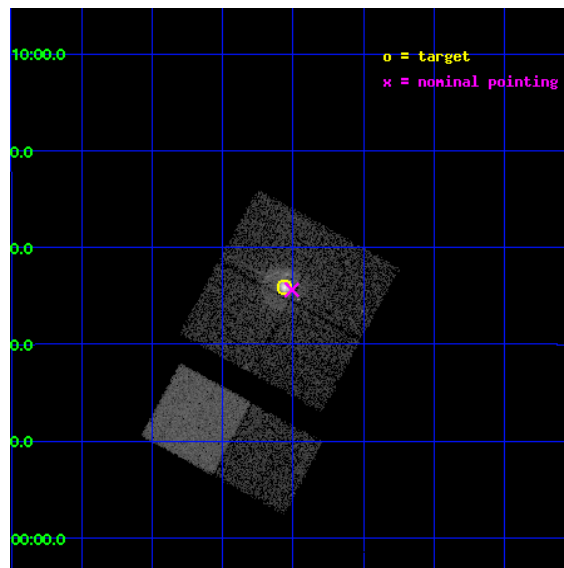
L2 Processing Date : Aug 30 2012

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# 1 Front

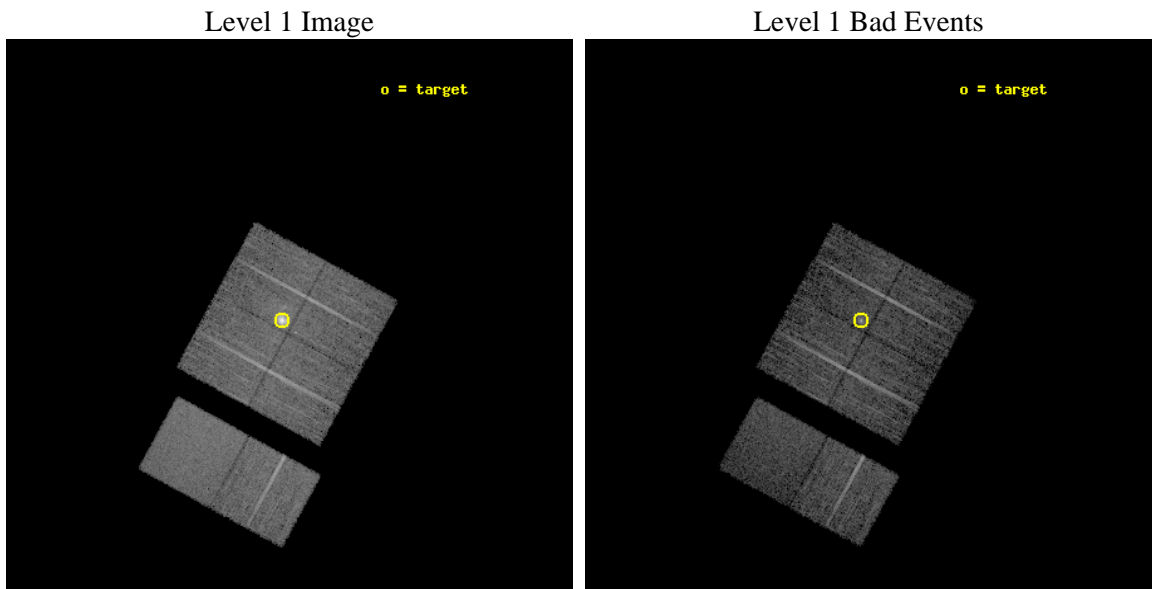
seq_num	590202	Sequence number
obs_id	1776	Observation id
title	HRC RESPONSE TO CONTINUUM SOURCE.	Proposal title
observer	Dr. CXC Calibration	Principal investigator
object	G21.5-0.9 [Chip I1, T=110, Offsets=-0,0,-1]	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	278.389583	Observer's specified target RA [deg]
dec_targ	-10.568528	Observer's specified target Dec [deg]
ra_nom	278.37708540157	Nominal RA [deg]
dec_nom	-10.572999239343	Nominal Dec [deg]
roll_nom	208.57965731678	Nominal Roll [deg]
revision	5	Processing version of data
ontime	7318.4000068009	Sum of GTIs [s]
livetime	7225.7300193033	Livetime [s]
ontime0	7318.4000068009	Sum of GTIs [s]
ontime1	7318.4000068009	Sum of GTIs [s]
ontime2	7318.4000068009	Sum of GTIs [s]
ontime3	7318.4000068009	Sum of GTIs [s]
ontime6	7315.1590066403	Sum of GTIs [s]
ontime7	7318.4000068009	Sum of GTIs [s]
l2events	64105	Number of level 2 events



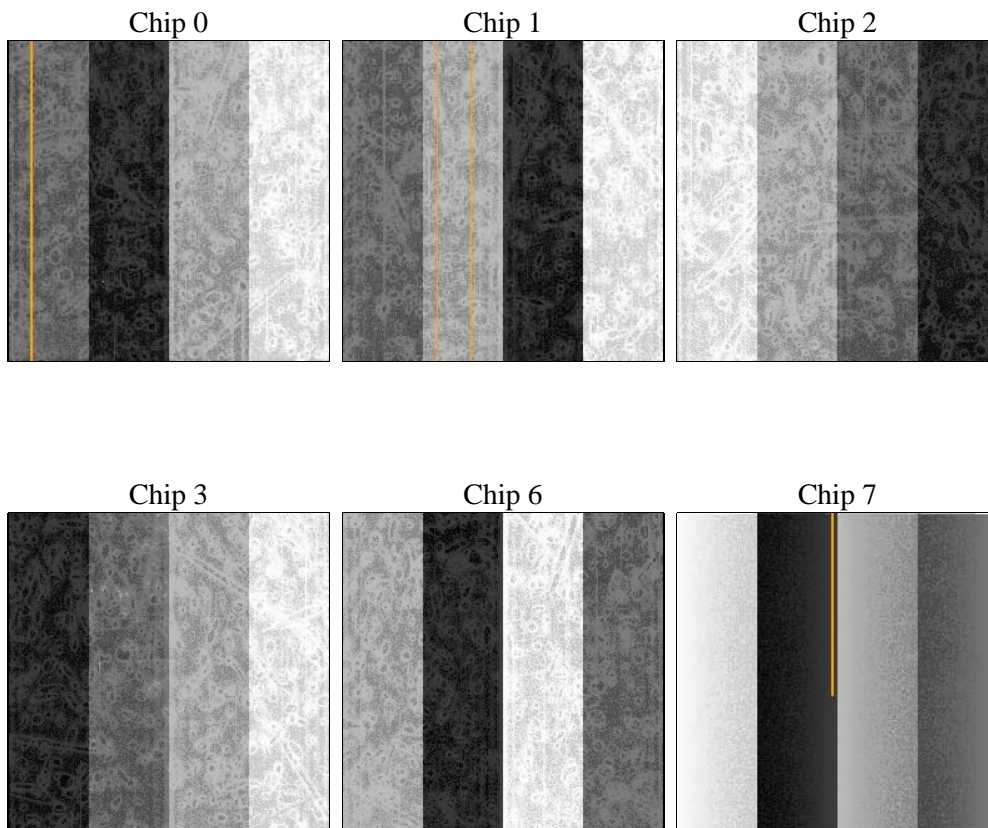
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	7560.000000	[s] Scheduled observation exposure time
ascdsver	8.4.5	Processing system revision	ontime	7318.4000068009	Sum of GTIs [s]
caldbver	4.5.1.1	&#160	ontime0	7318.4000068009	Sum of GTIs [s]
date	2012-08-30T03:41:01	Date and time of file creation	ontime1	7318.4000068009	Sum of GTIs [s]
revision	5	Processing version of data	ontime2	7318.4000068009	Sum of GTIs [s]
			ontime3	7318.4000068009	Sum of GTIs [s]
			ontime6	7315.1590066403	Sum of GTIs [s]
			ontime7	7318.4000068009	Sum of GTIs [s]
			l1events	329465	Number of level 1 events

### 2.1.4 Events

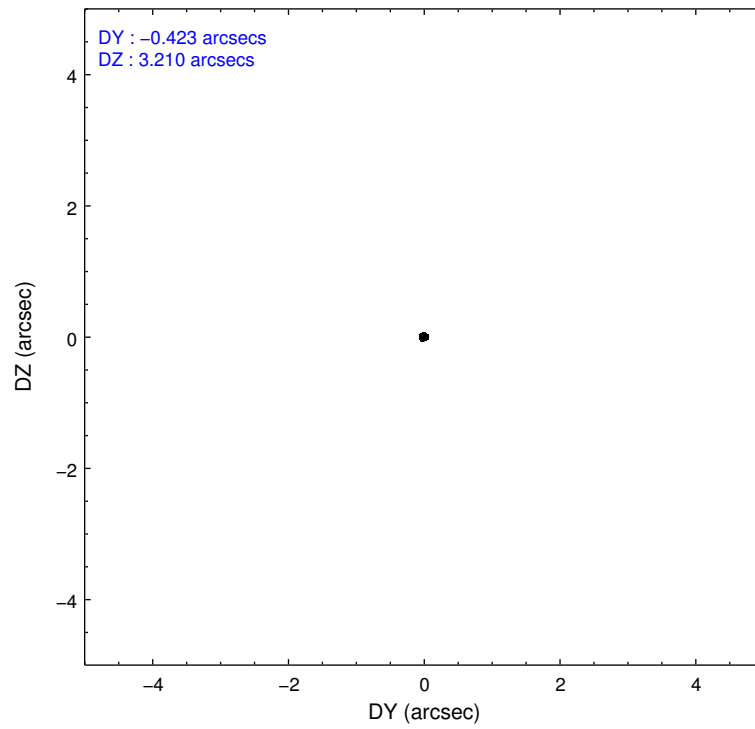
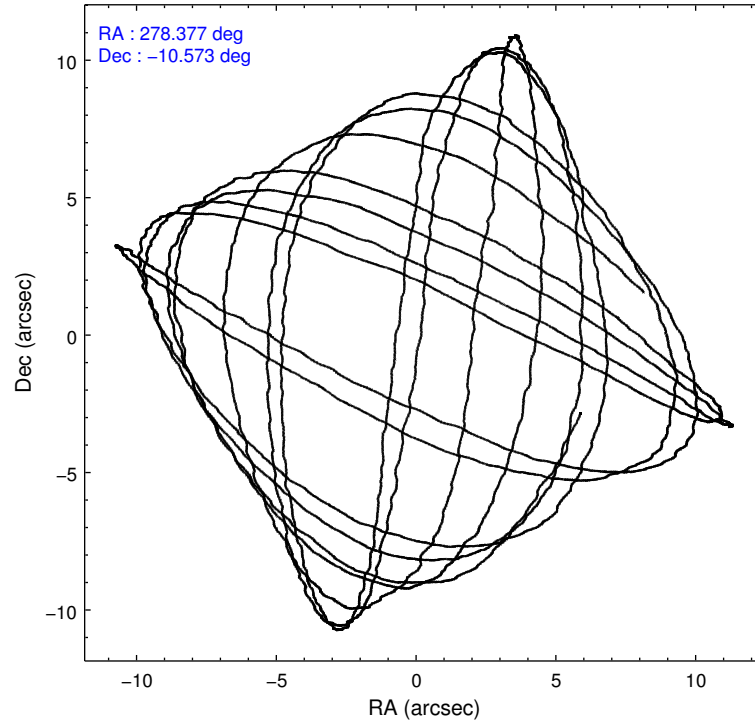
	ccd 0	ccd 1	ccd 2	ccd 3	ccd 6	ccd 7
level 1 events	46187	67439	51721	53459	54029	56630
rejected events	40086	41437	46587	47305	48759	35312
rejected %	86%	61%	90%	88%	90%	62%

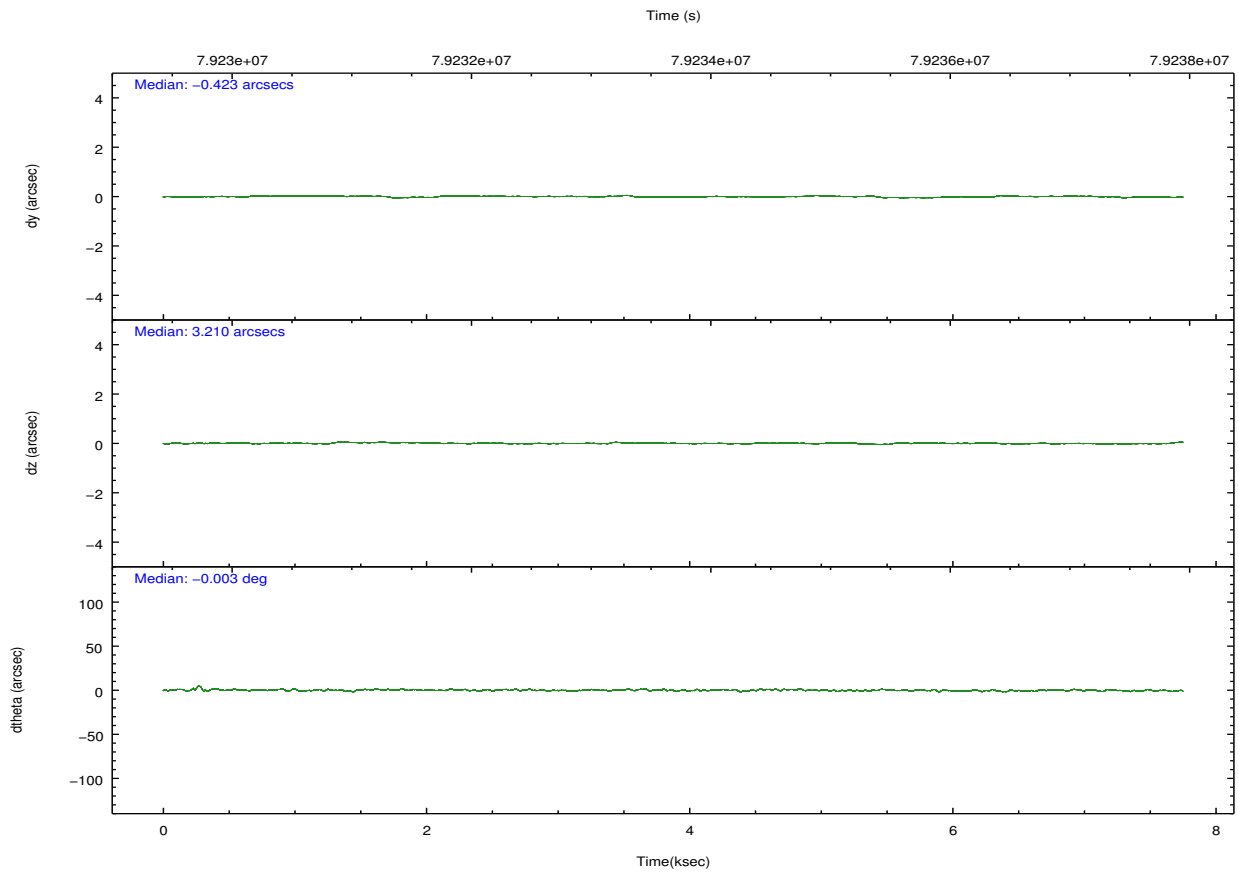
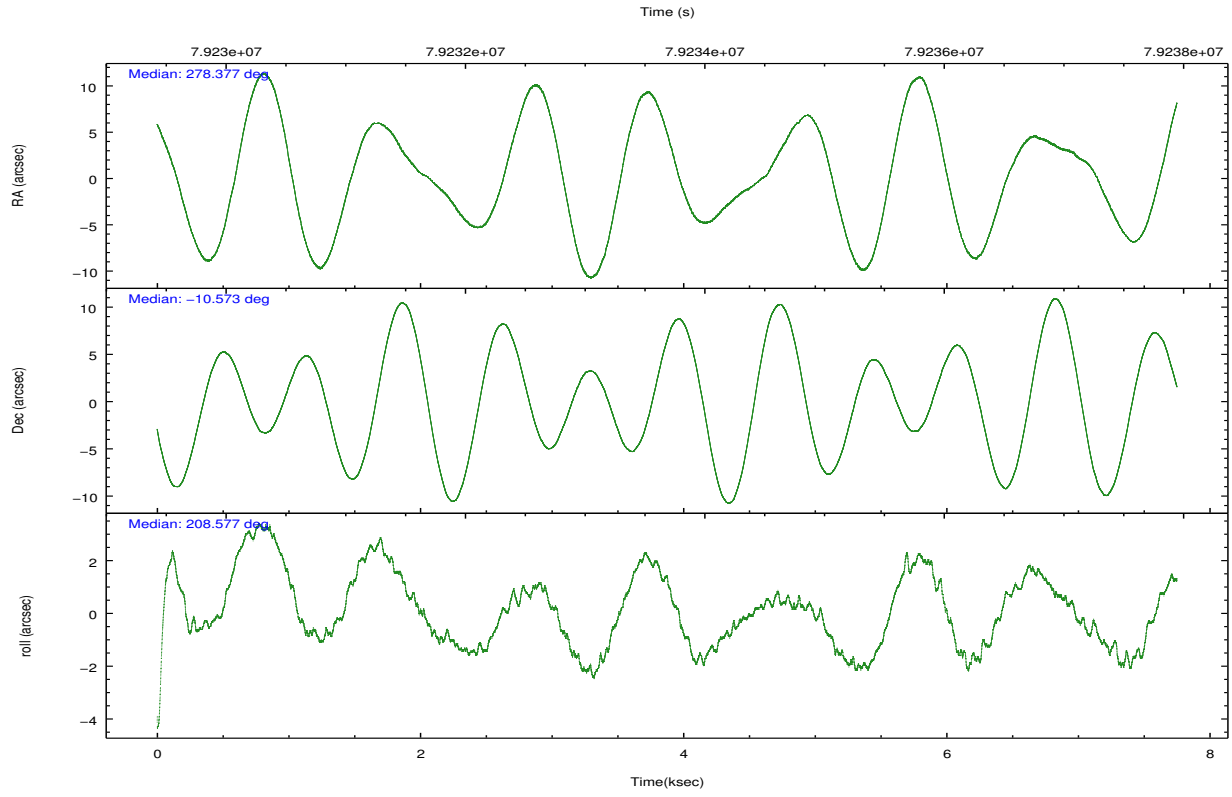
	ccd 0	ccd 1	ccd 2	ccd 3	ccd 6	ccd 7
grade 0 events	1715	7149	1198	1584	989	1230
	3%	10%	2%	2%	1%	2%
grade 1 events	10	47	6	9	7	26
	0%	0%	0%	0%	0%	0%
grade 2 events	2303	14219	2076	2580	2177	4651
	4%	21%	4%	4%	4%	8%
grade 3 events	411	705	326	322	320	1252
	0%	1%	0%	0%	0%	2%
grade 4 events	376	696	314	315	306	1163
	0%	1%	0%	0%	0%	2%
grade 5 events	915	1364	994	1045	1220	3366
	1%	2%	1%	1%	2%	5%
grade 6 events	1302	3256	1223	1359	1480	13032
	2%	4%	2%	2%	2%	23%
grade 7 events	39155	40003	45584	46245	47530	31910
	84%	59%	88%	86%	87%	56%

## 2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-012367	ACIS-012367	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	278.391853	278.3770854015665	Subarray requested	NONE	NONE
[deg] Pointing Dec	-10.549515	-10.57299923934336	Alternating exposures requested	N	N
[deg] Pointing Roll	208.373667	208.5796573167816	[s] Primary exposure time	0.000000	3.2
[mm] SIM focus pos	-0.782348	-0.7809083437167272			
[mm] SIM defocus	0	0.001439871863259334			
[mm] SIM translation stage pos	-238.277263	-238.2741181829365			
[mm] SIM translation stage offset	4.6848	4.681665180006831			
[s] Observation start time (MET)	79229996.184000	79229619.880706			
Observation start date	2000-07-06T00:18:52	2000-07-06T00:13:39			
[s] Observation end time (MET)	79237556.184000	79237693.293503			
Observation end date	2000-07-06T02:24:52	2000-07-06T02:28:13			
Read mode	TIMED	TIMED			

## 2.3 Aspect



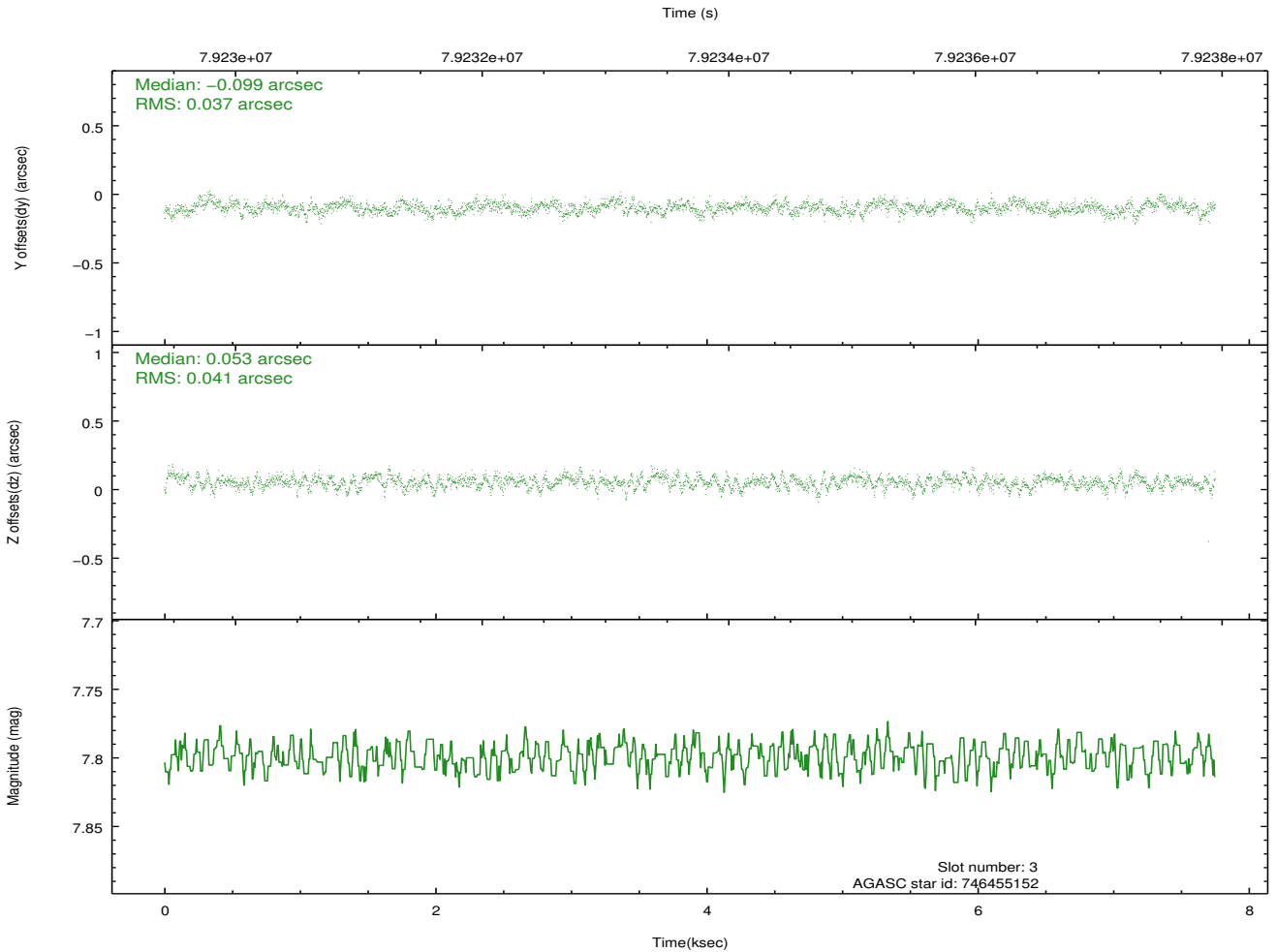
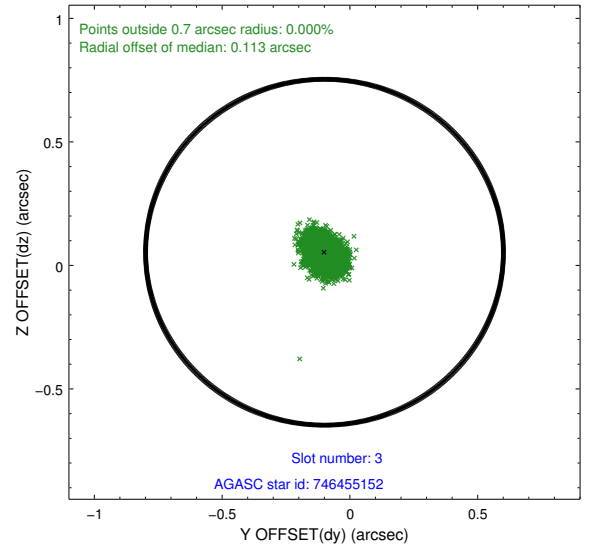
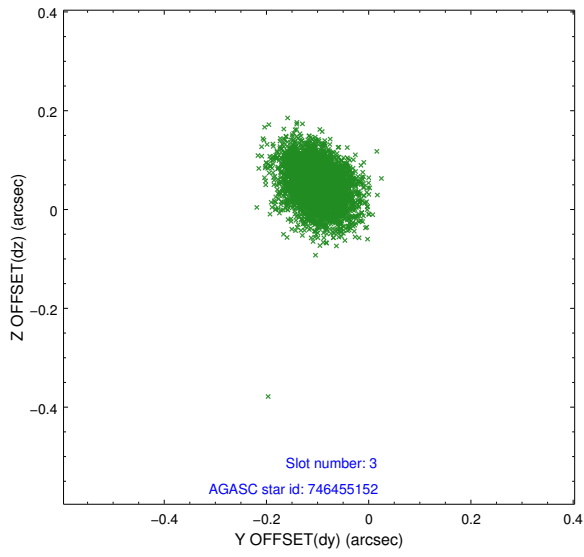


### Slot Statistics

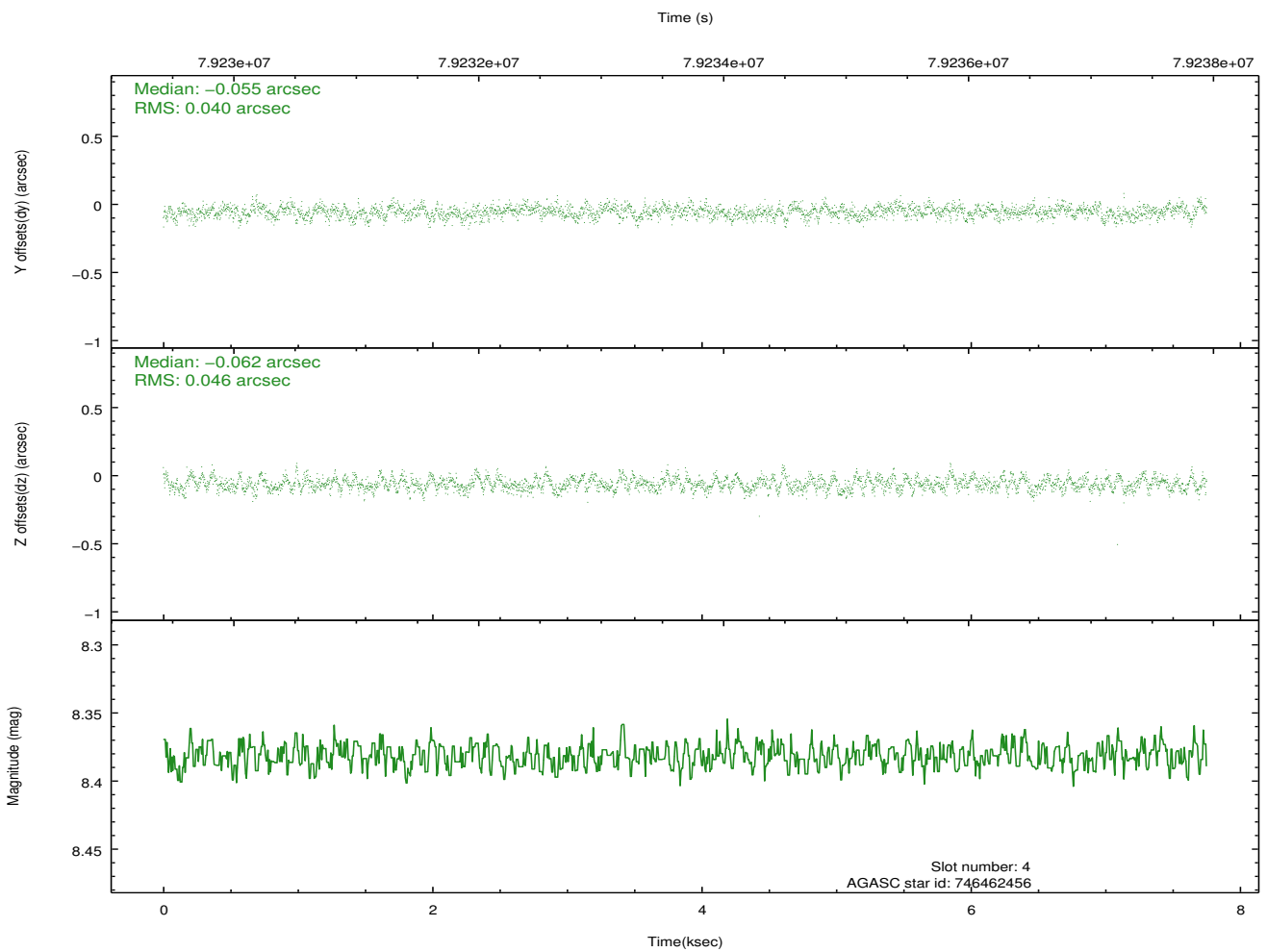
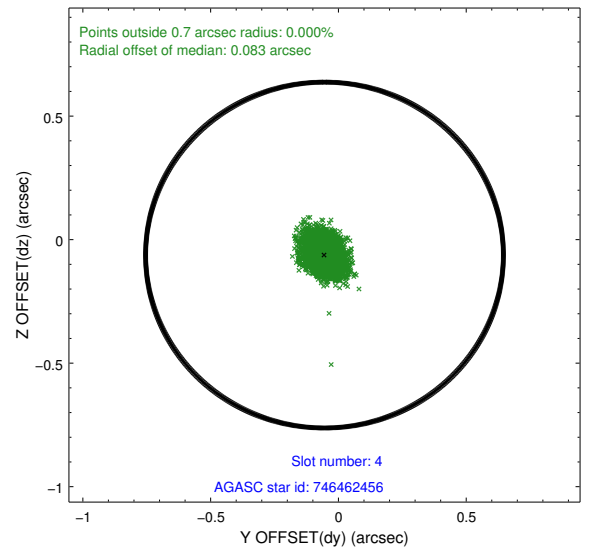
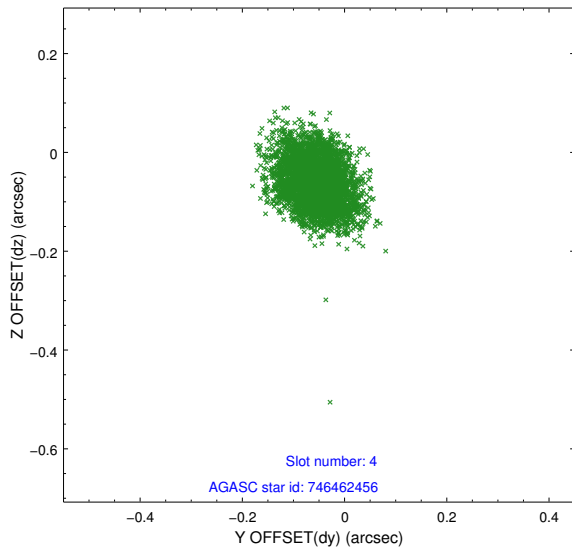
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-I-2	7.16	1890	-0.063	-0.071	0.009	0.015	0.000000	0.000000	-753.57	-737.30
1	FID	ACIS-I-4	7.20	1889	-0.010	0.060	0.006	0.011	0.000000	0.000000	2160.20	1168.77
2	FID	ACIS-I-5	7.23	1891	-0.028	0.080	0.009	0.014	0.000000	0.000000	-1806.70	1168.00
3	GUIDE	746455152	7.80	3781	-0.099	0.053	0.057	0.095	278.447893	-9.976732	-1154.75	-1719.06
4	GUIDE	746462456	8.38	3782	-0.055	-0.062	0.065	0.104	278.652171	-10.530173	-843.94	377.26
5	GUIDE	746455112	8.93	3780	0.230	-0.128	0.068	0.114	278.266531	-10.703234	653.05	277.16
6	GUIDE	746460328	9.81	3781	-0.001	0.032	0.090	0.148	278.603974	-9.898096	-1775.98	-1704.83
7	GUIDE	746995400	9.49	3777	-0.074	0.105	0.090	0.151	278.078957	-11.289885	2238.27	1821.36

## 2.4 Star Slots

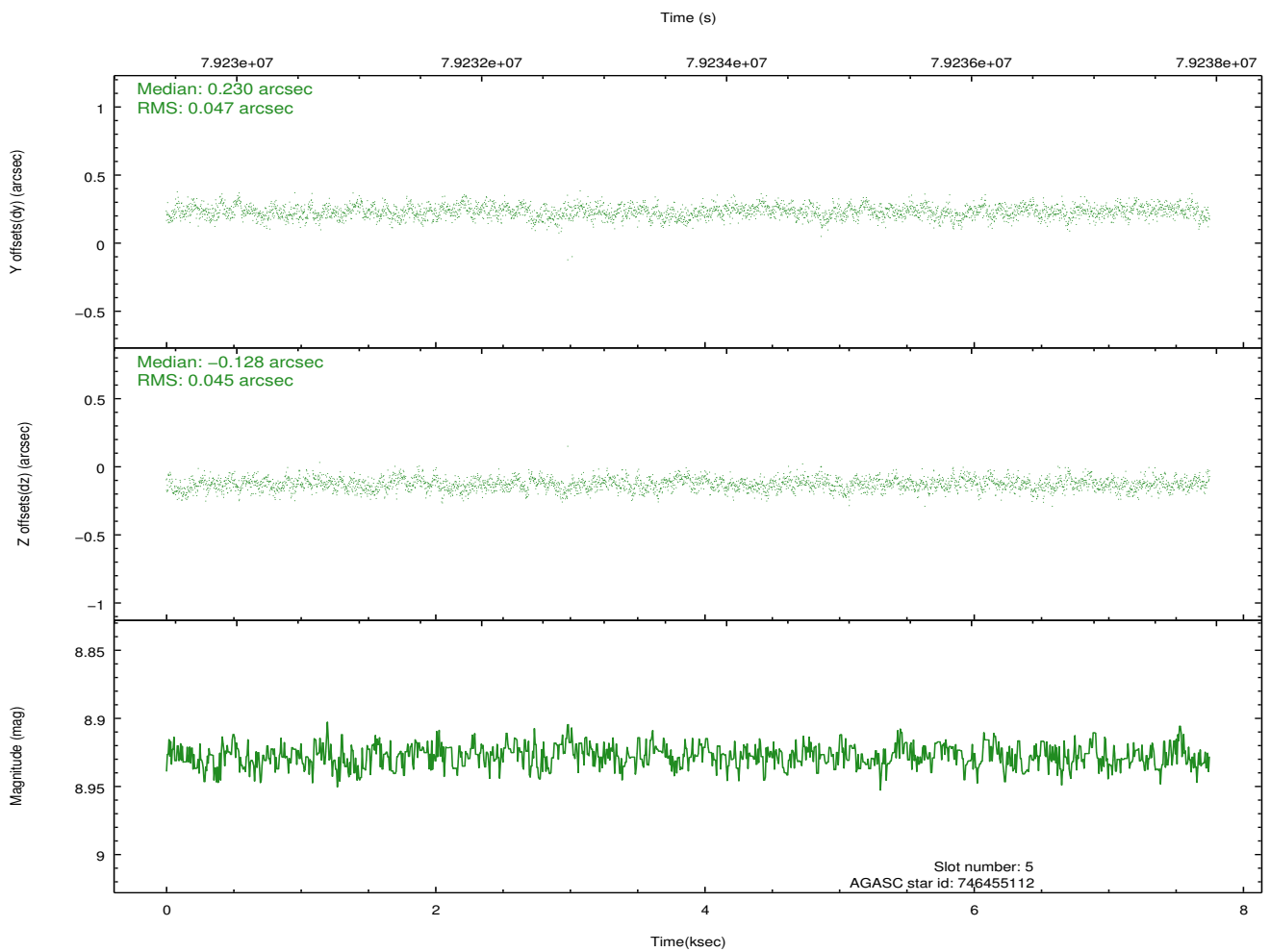
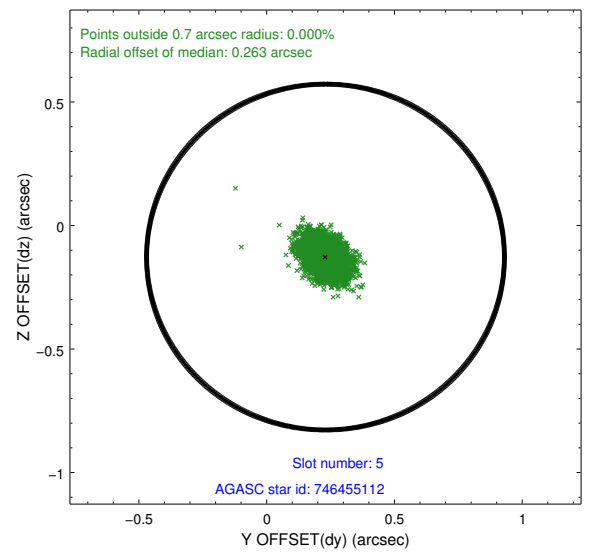
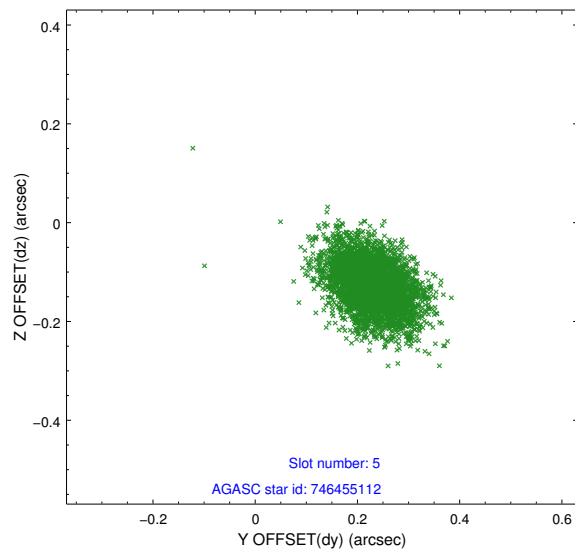
### 2.4.1 Slot 3



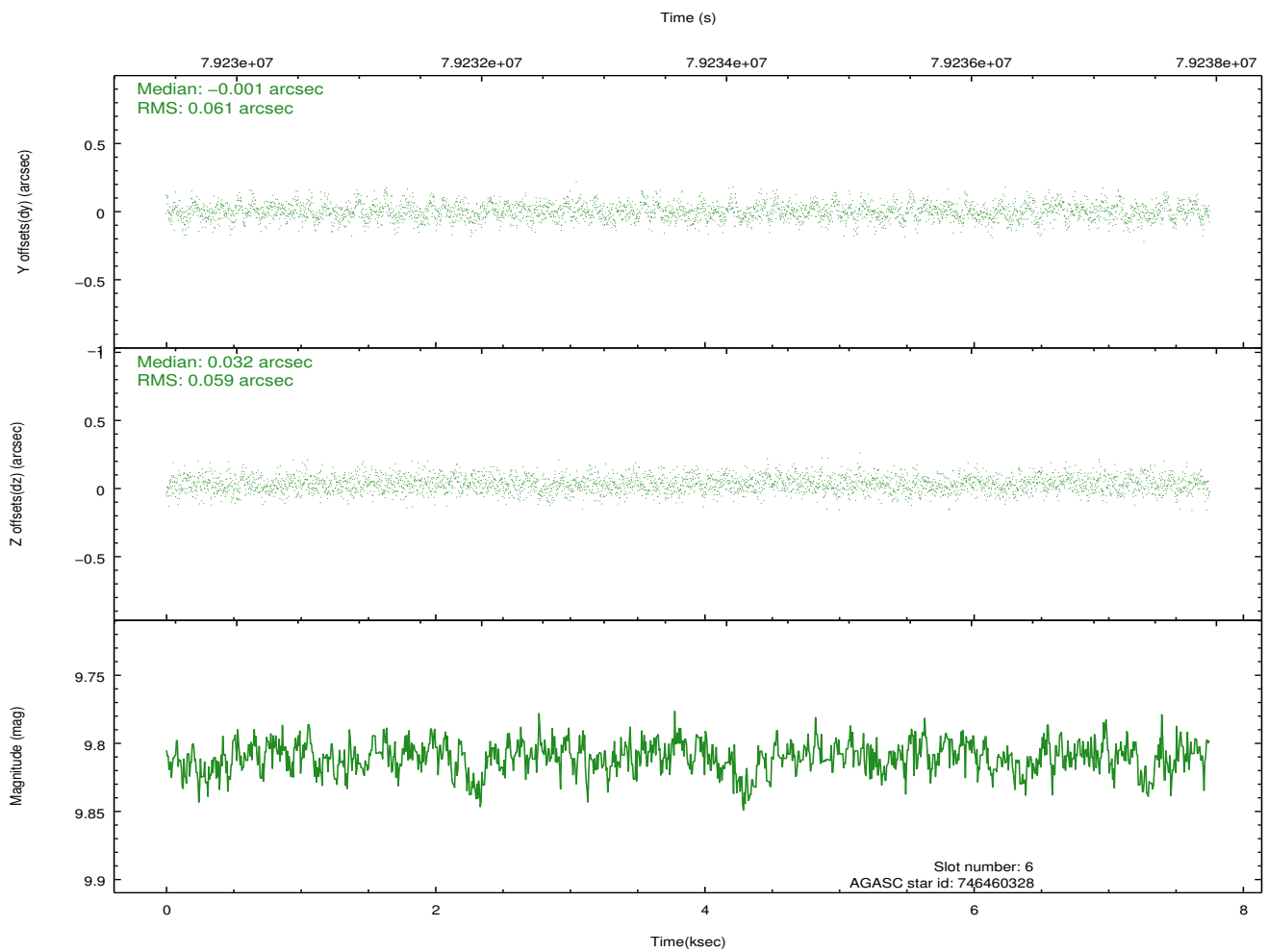
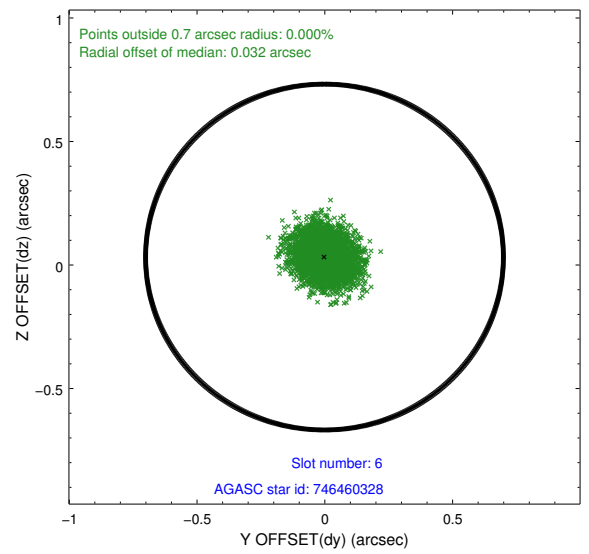
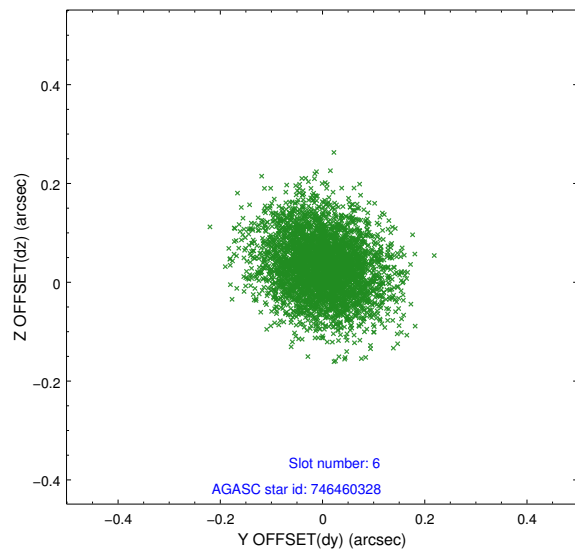
## 2.4.2 Slot 4



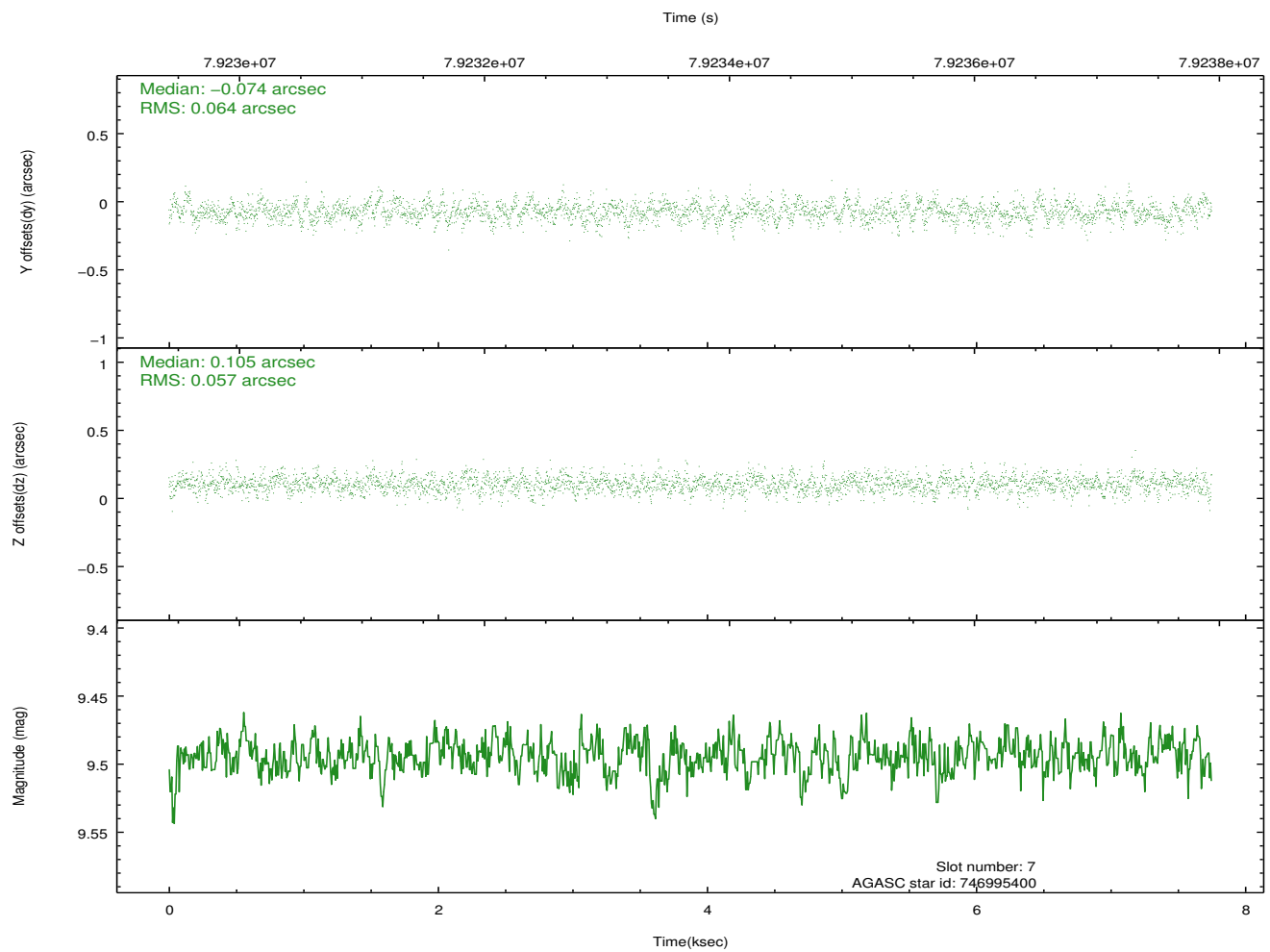
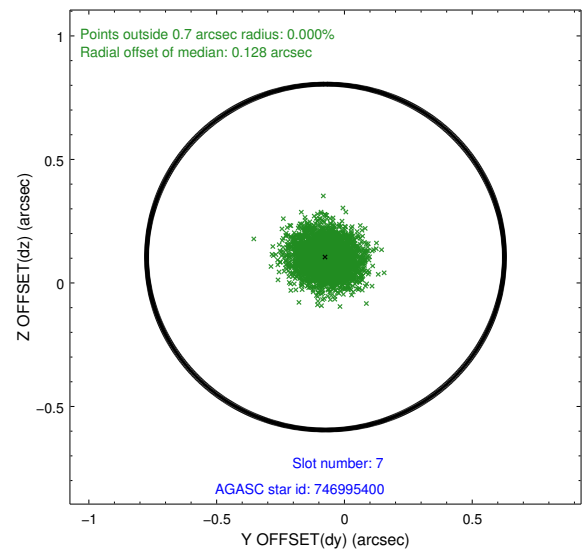
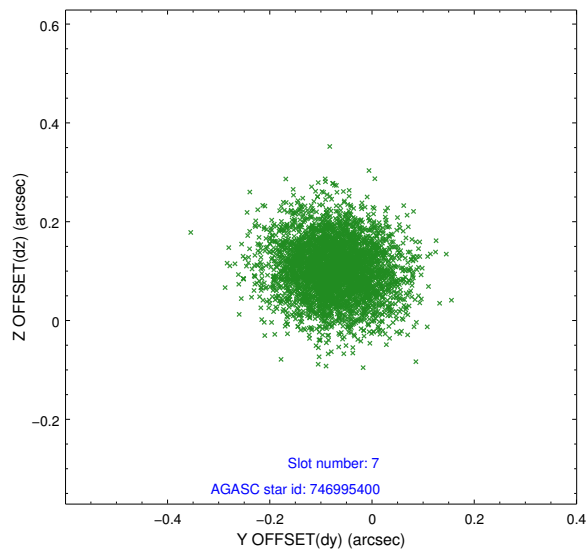
### 2.4.3 Slot 5



## 2.4.4 Slot 6

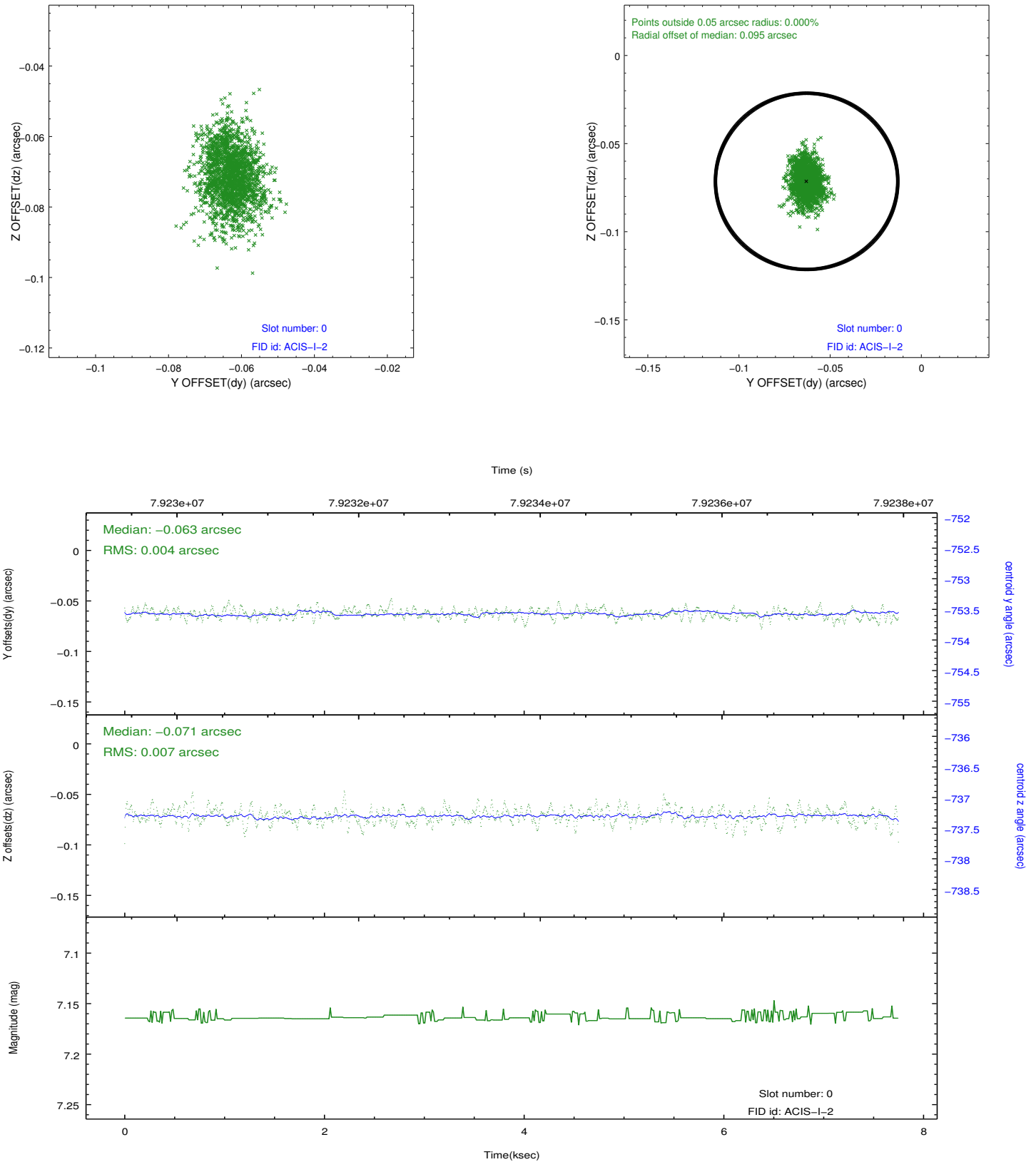


## 2.4.5 Slot 7

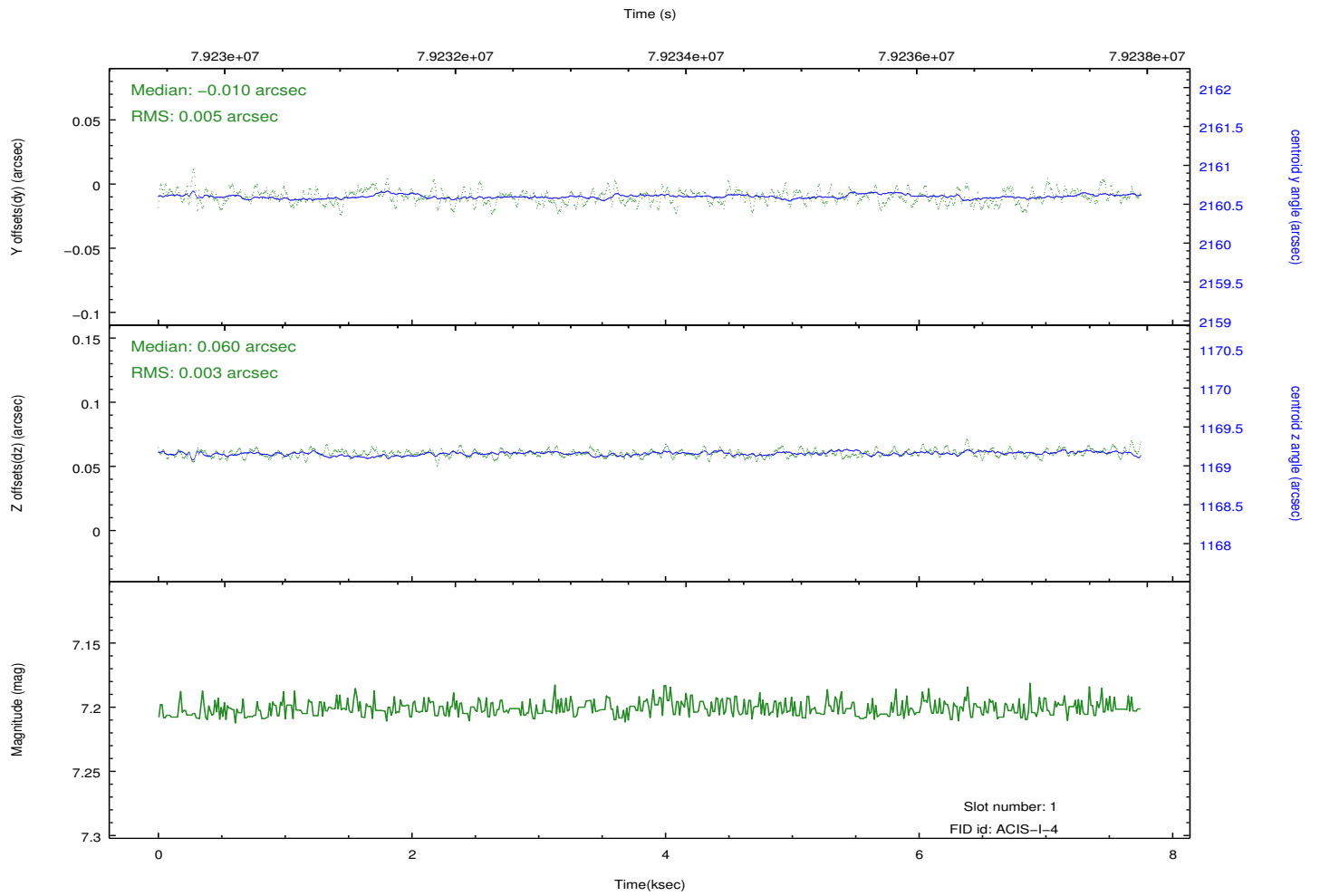
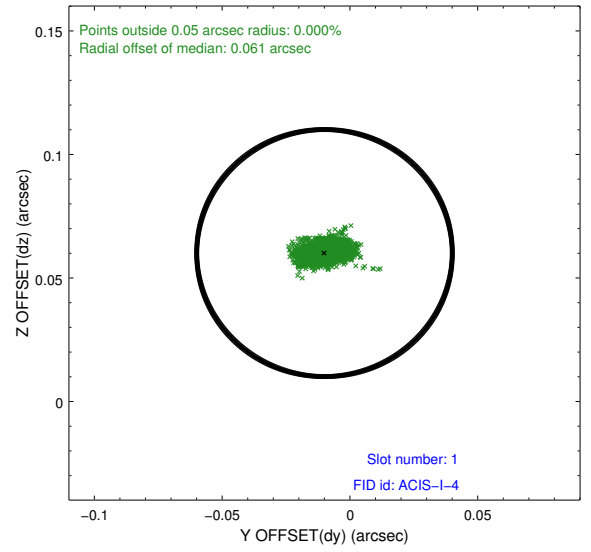
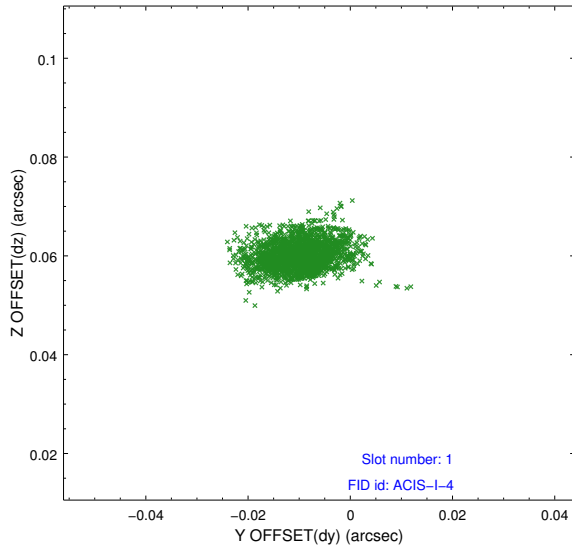


## 2.5 FID Slots

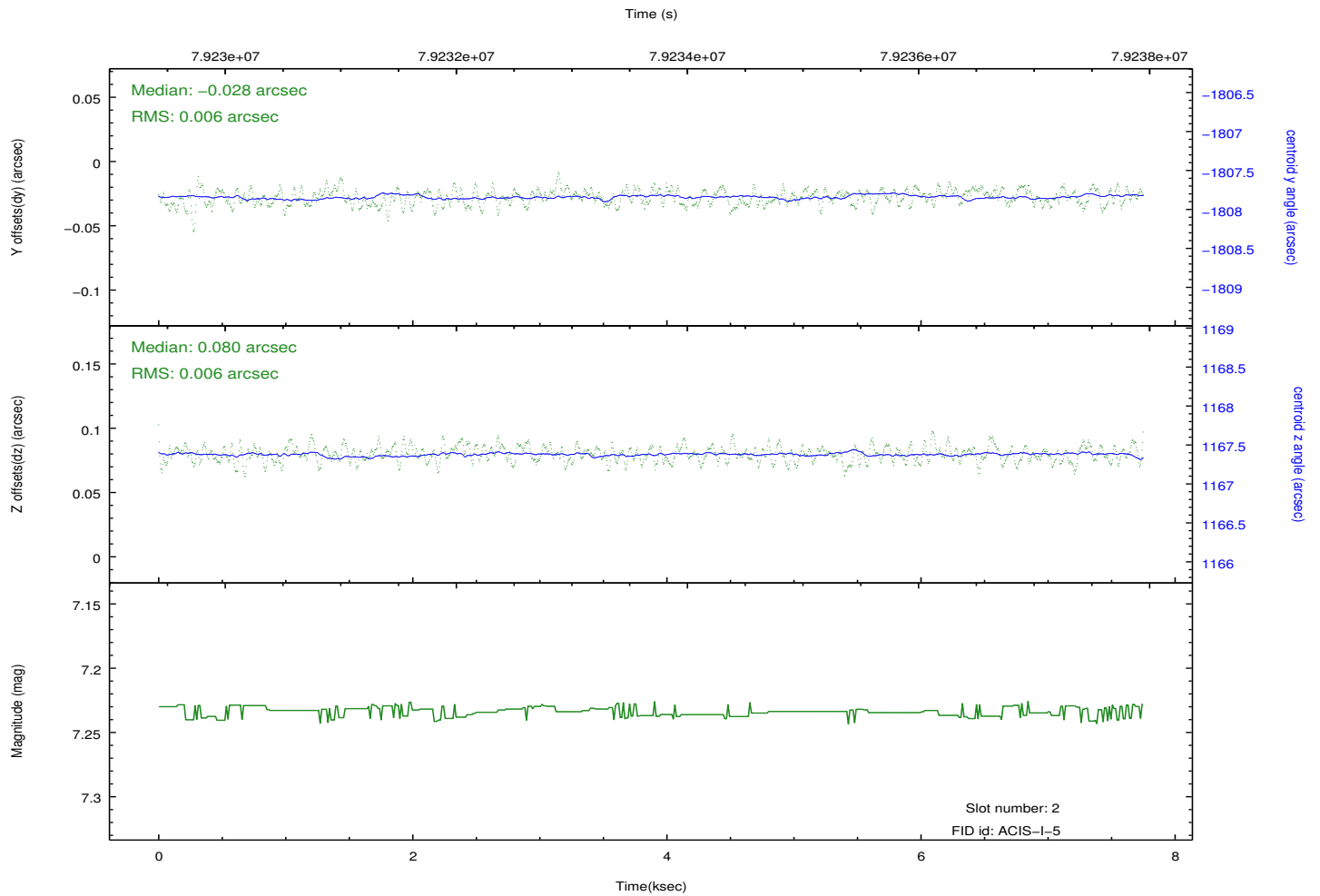
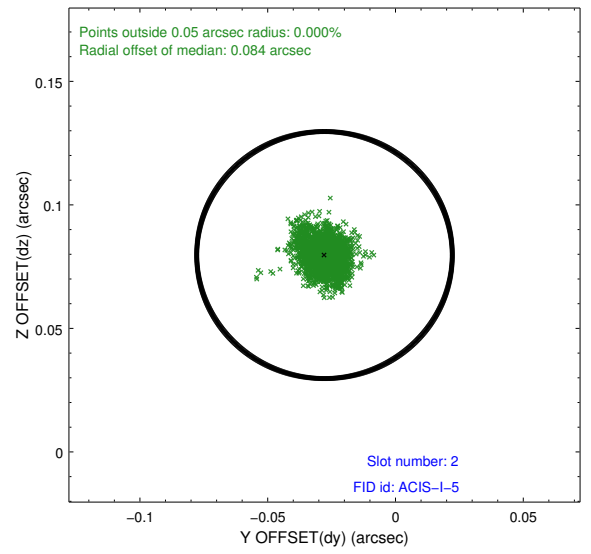
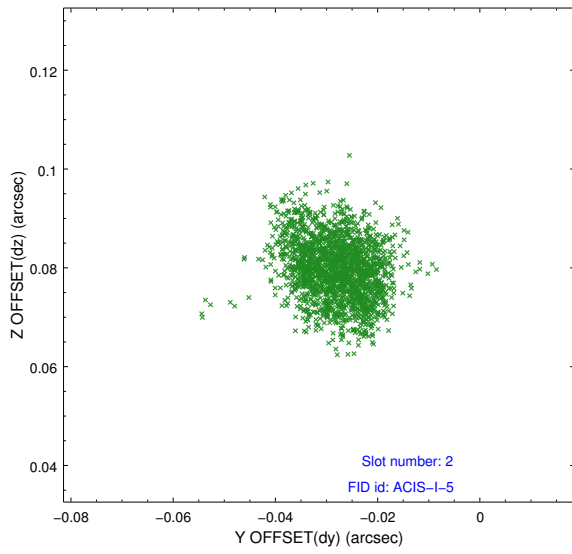
### 2.5.1 Slot 0



## 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)	2018.03.05
V&V Edition	2
V&V Disposition and Status	OK
V&V Charge Time	7.324

## 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](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.