

# V&V Reference Report

## L2 ASCDS Version : 8.4.5

Observation 1782 - L2 Version 5  
Chandra X-Ray Center

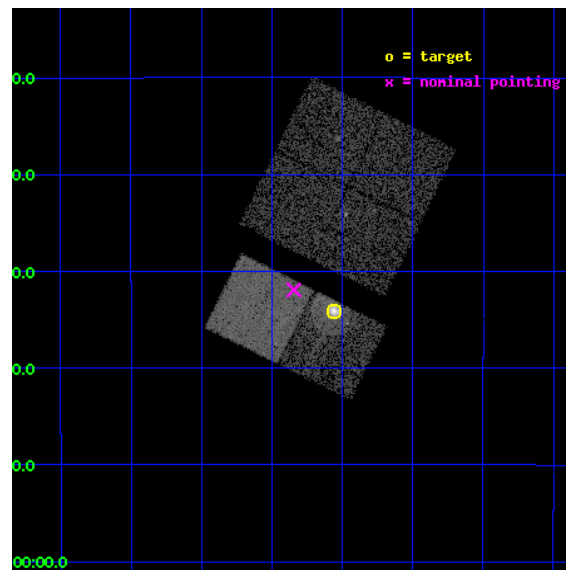
L2 Processing Date : Aug 30 2012

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# 1 Front

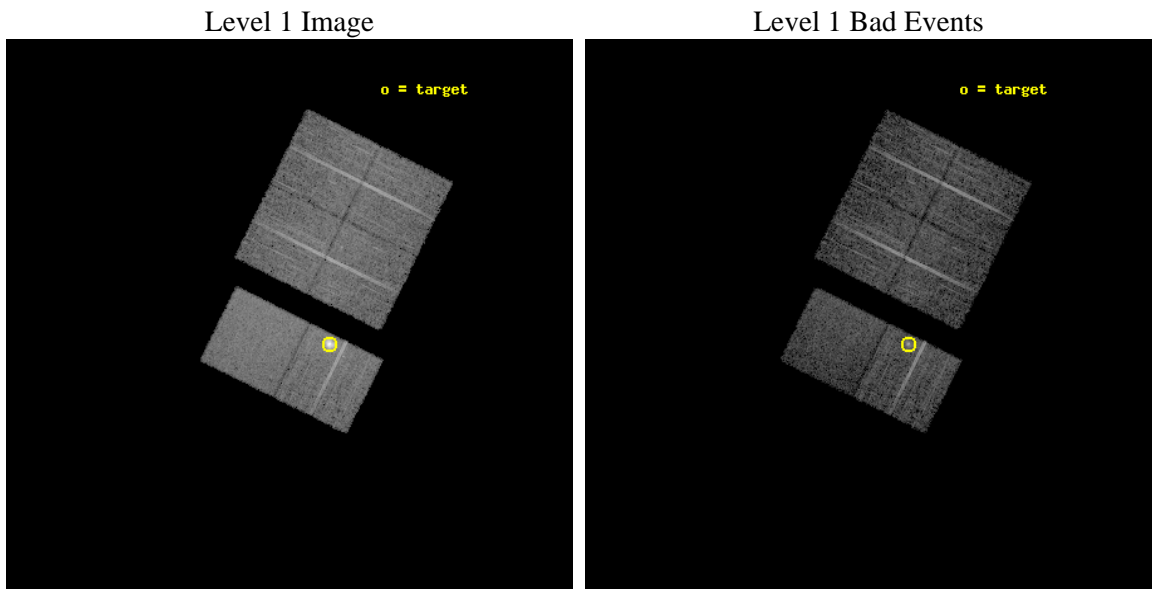
seq_num	590208	Sequence number
obs_id	1782	Observation id
title	HRC RESPONSE TO CONTINUUM SOURCE.	Proposal title
observer	Dr. CXC Calibration	Principal investigator
object	G21.5-0.9 [Chip S2, T=110, Offsets=5,0,-3]	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	278.389583	Observer's specified target RA [deg]
dec_targ	-10.568528	Observer's specified target Dec [deg]
ra_nom	278.46097714374	Nominal RA [deg]
dec_nom	-10.53199316494	Nominal Dec [deg]
roll_nom	206.37444674822	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	7318.4000068009	Sum of GTIs [s]
ontime7	7318.4000068009	Sum of GTIs [s]
l2events	63402	Number of level 2 events



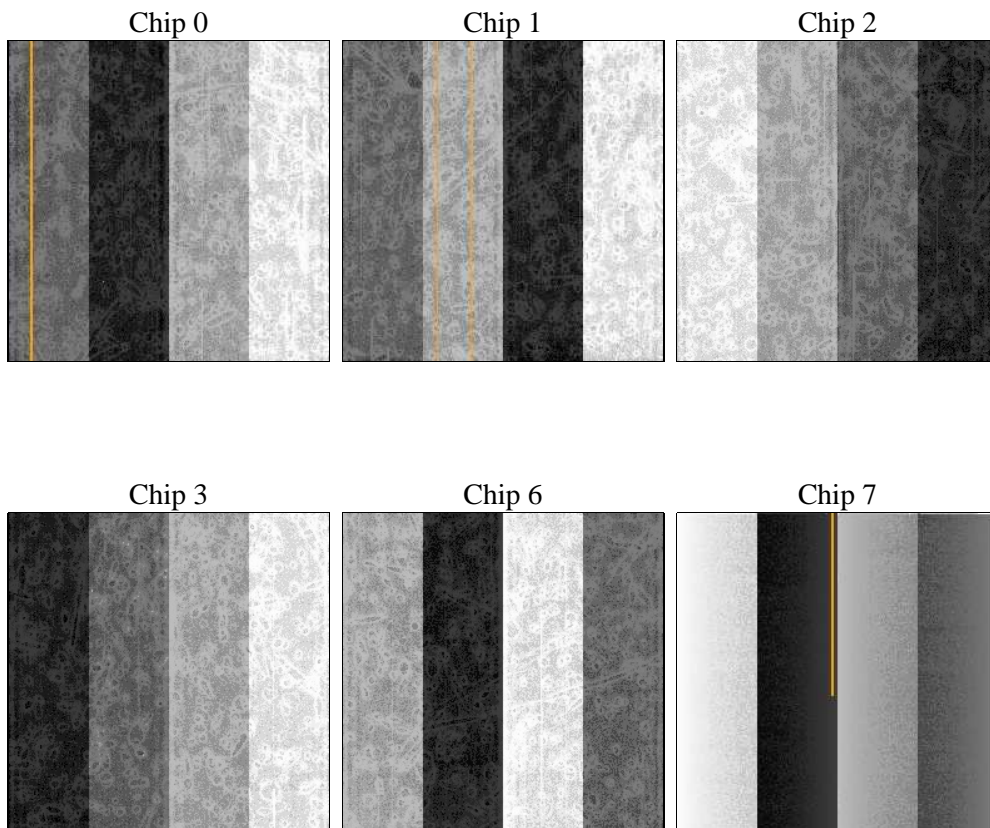
## 2 OBI

### 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]
caldsver	4.5.1.1	&#160	ontime0	7318.4000068009	Sum of GTIs [s]
date	2012-08-30T03:40:32	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	7318.4000068009	Sum of GTIs [s]
			ontime7	7318.4000068009	Sum of GTIs [s]
			l1events	324192	Number of level 1 events

### 2.1.4 Events

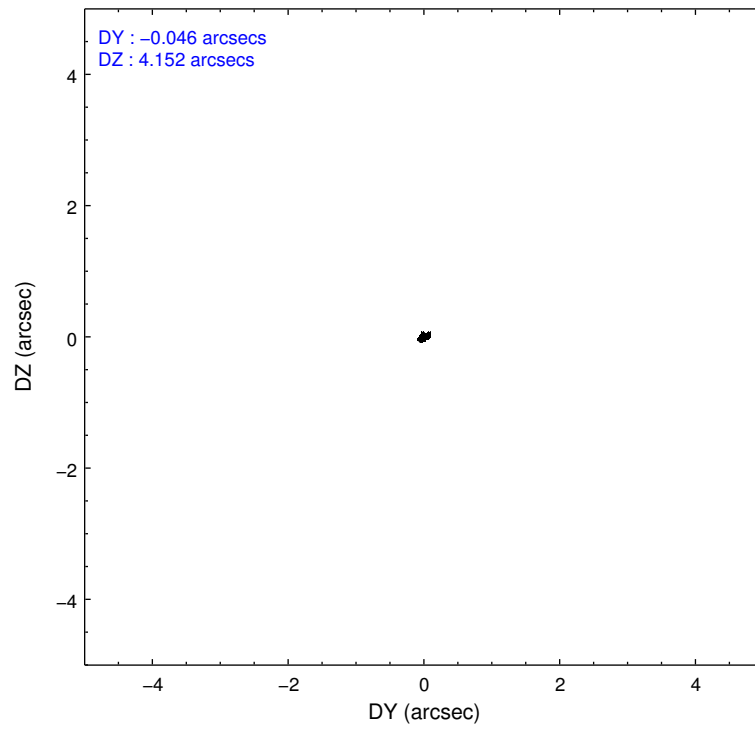
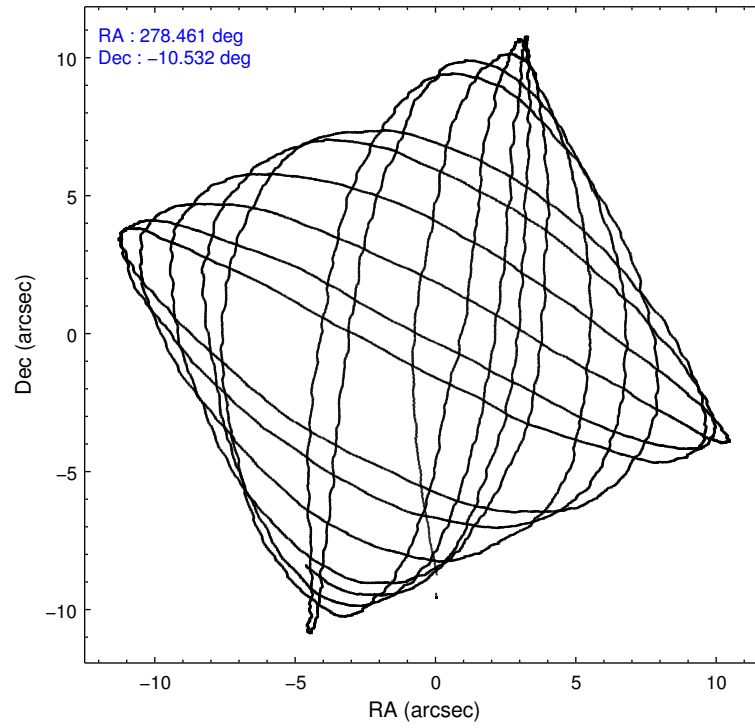
	ccd 0	ccd 1	ccd 2	ccd 3	ccd 6	ccd 7		ccd 0	ccd 1	ccd 2	ccd 3	ccd 6	ccd 7
level 1 events	48151	47186	49569	48997	72826	57463	grade 0 events	1336	1309	1338	1190	3800	1356
rejected events	42722	41608	44050	43787	47510	35491		2%	2%	2%	2%	5%	2%
rejected %	88%	88%	88%	89%	65%	61%	grade 1 events	14	10	10	7	27	32
								0%	0%	0%	0%	0%	0%
							grade 2 events	2039	2067	2305	2060	17220	4751
								4%	4%	4%	4%	23%	8%
							grade 3 events	395	445	326	348	488	1307
								0%	0%	0%	0%	0%	2%
							grade 4 events	384	416	336	316	417	1147
								0%	0%	0%	0%	0%	1%
							grade 5 events	1042	1056	893	1005	1339	3533
								2%	2%	1%	2%	1%	6%
							grade 6 events	1278	1347	1220	1303	3408	13433
								2%	2%	2%	2%	4%	23%
							grade 7 events	41663	40536	43141	42768	46127	31904
								86%	85%	87%	87%	63%	55%

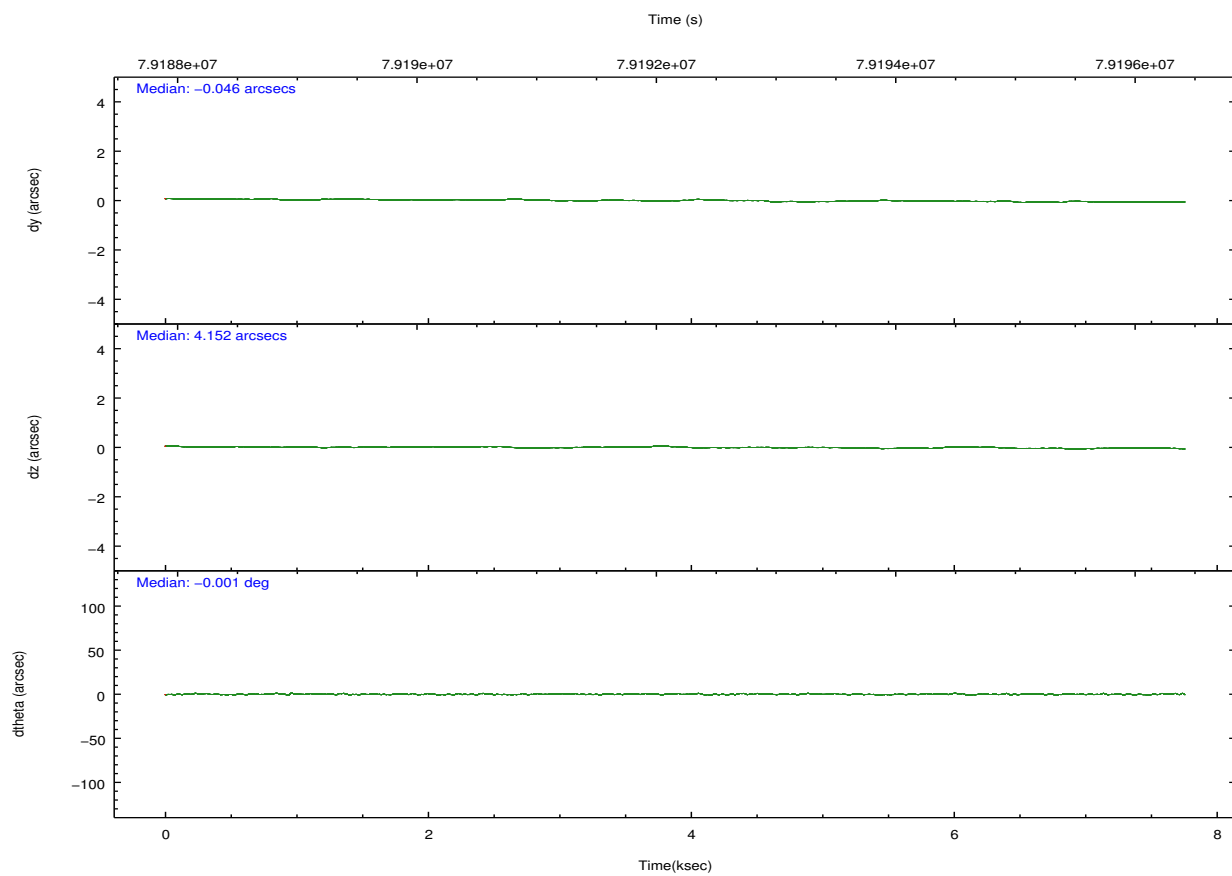
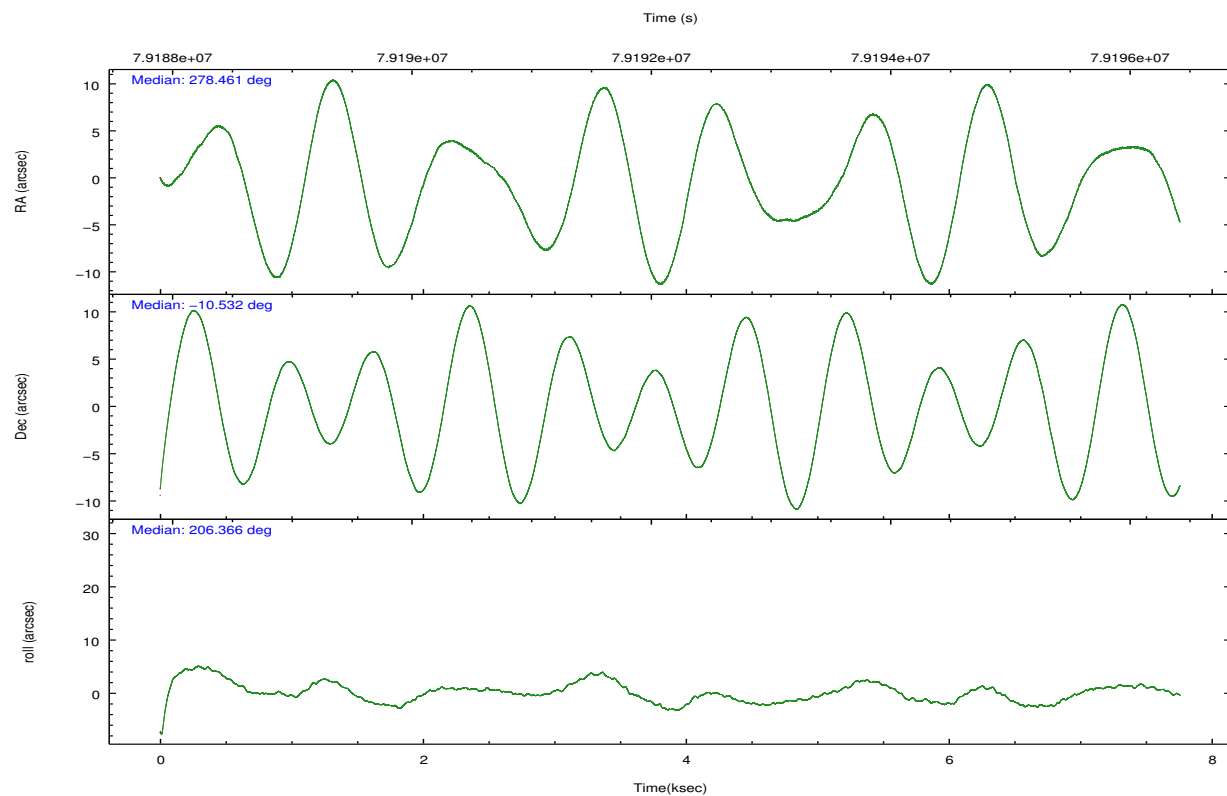
## 2.2 Compared Parameters

Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-012367	ACIS-012367
Grating	NONE	NONE
Data mode	FAINT	FAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	278.476235	278.4609771437363
[deg] Pointing Dec	-10.509125	-10.53199316493973
[deg] Pointing Roll	206.220612	206.3744467482215
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-199.707123	-199.7145787182124
[mm] SIM translation stage offset	9.5746	9.582056135204567
[s] Observation start time (MET)	79188476.184000	79188099.69167601
Observation start date	2000-07-05T12:46:52	2000-07-05T12:41:39
[s] Observation end time (MET)	79196036.184000	79196181.816974
Observation end date	2000-07-05T14:52:52	2000-07-05T14:56:21
Read mode	TIMED	TIMED

Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	NONE	NONE
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	3.2

## 2.3 Aspect



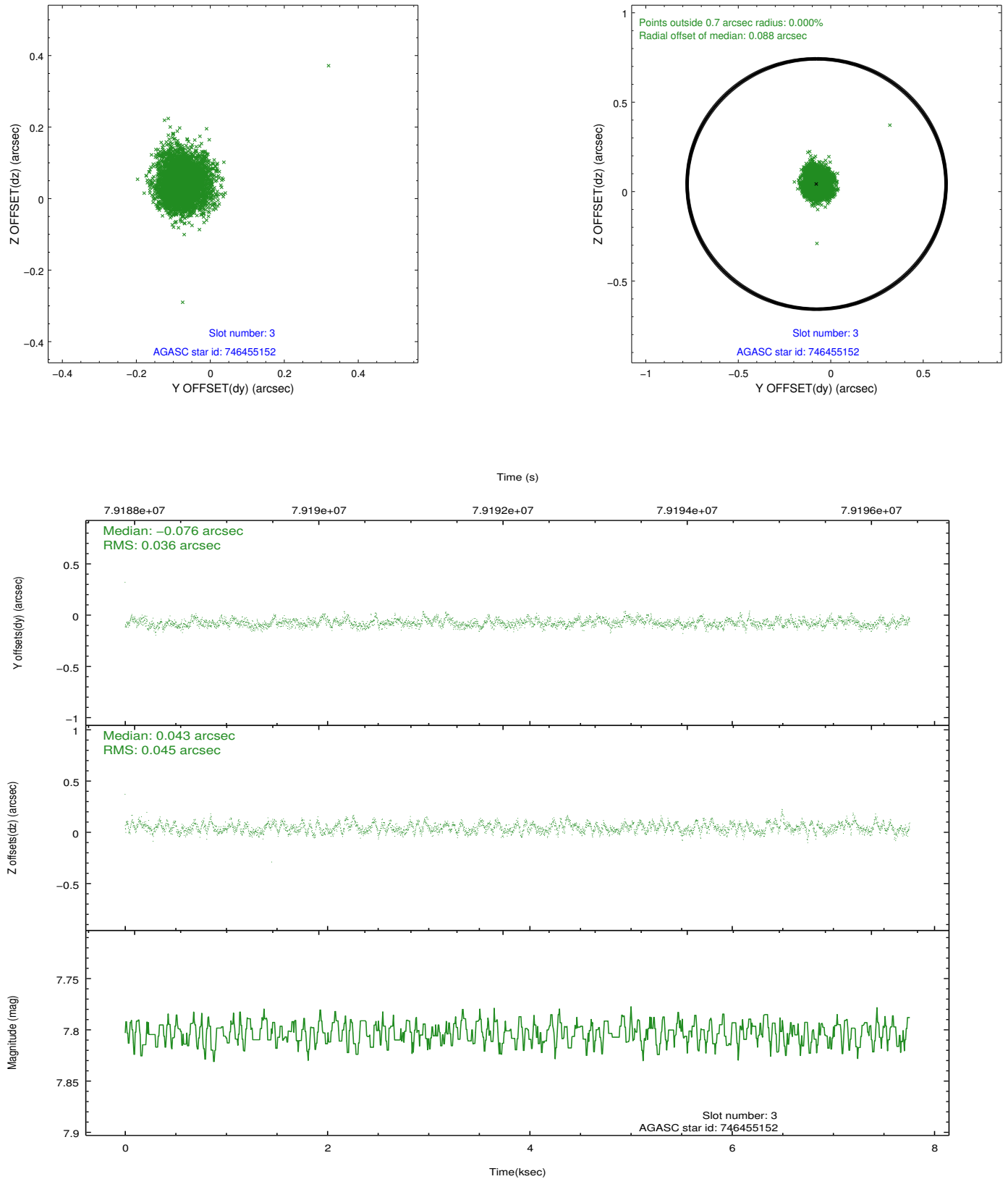


### Slot Statistics

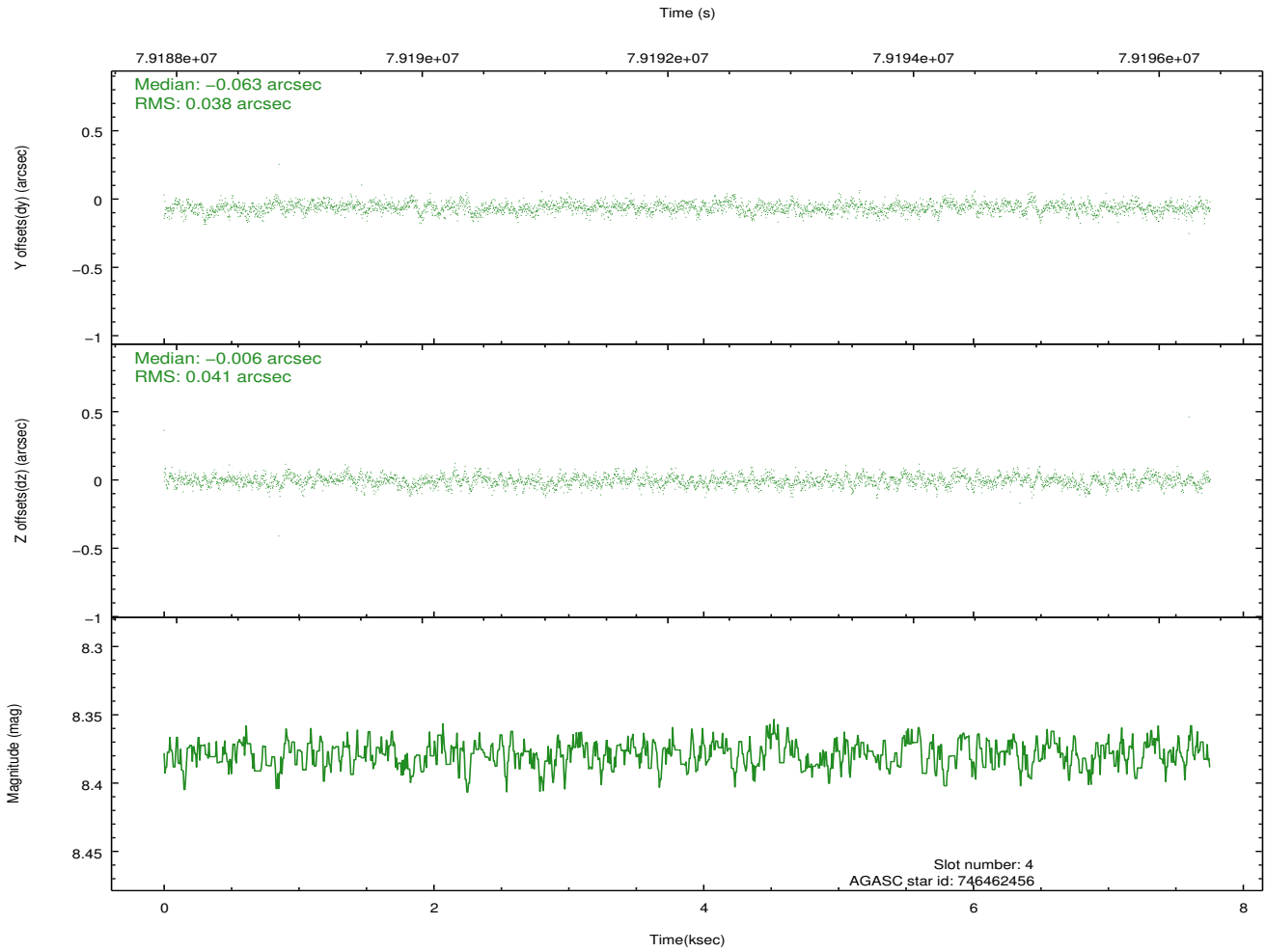
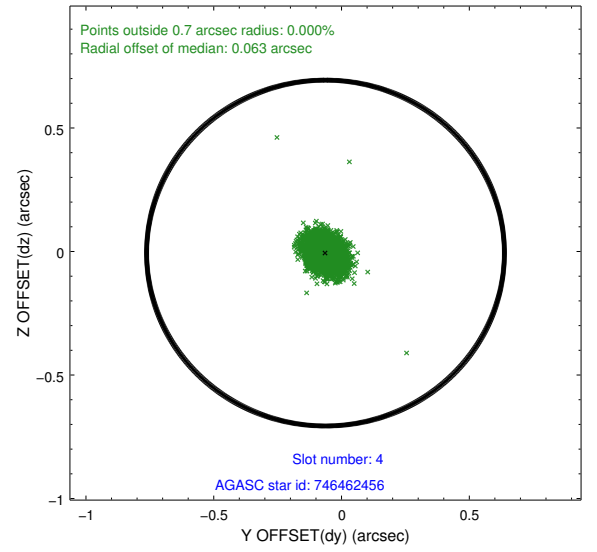
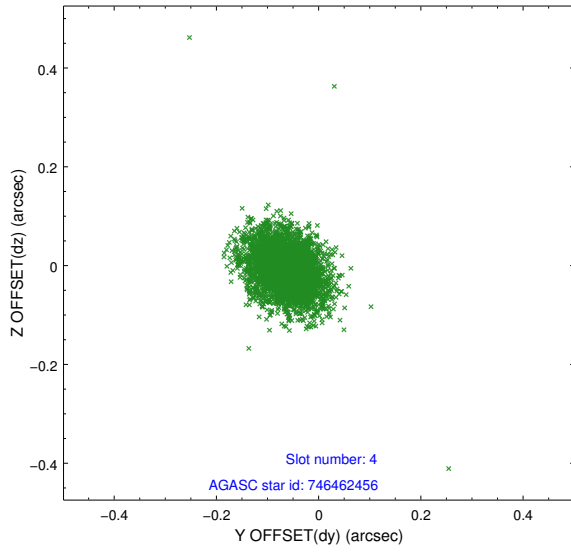
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	7.15	1893	0.049	0.109	0.007	0.011	0.000000	0.000000	-753.12	-1527.59
1	FID	ACIS-S-4	7.24	1892	-0.029	-0.053	0.006	0.011	0.000000	0.000000	2159.85	379.96
2	FID	ACIS-S-5	7.23	1892	-0.051	-0.046	0.007	0.012	0.000000	0.000000	-1805.03	374.66
3	GUIDE	746455152	7.80	3784	-0.076	0.043	0.060	0.096	278.447893	-9.976732	-756.39	-1763.22
4	GUIDE	746462456	8.38	3784	-0.063	-0.006	0.057	0.096	278.652171	-10.530173	-525.26	343.42
5	GUIDE	746462392	8.55	3784	-0.090	-0.082	0.072	0.117	279.038421	-10.890715	-1175.67	2112.70
6	GUIDE	746455112	8.93	3782	0.214	-0.025	0.063	0.109	278.266531	-10.703234	974.27	300.69
7	GUIDE	746460328	9.80	3780	0.018	0.074	0.091	0.150	278.603974	-9.898096	-1377.62	-1772.51

## 2.4 Star Slots

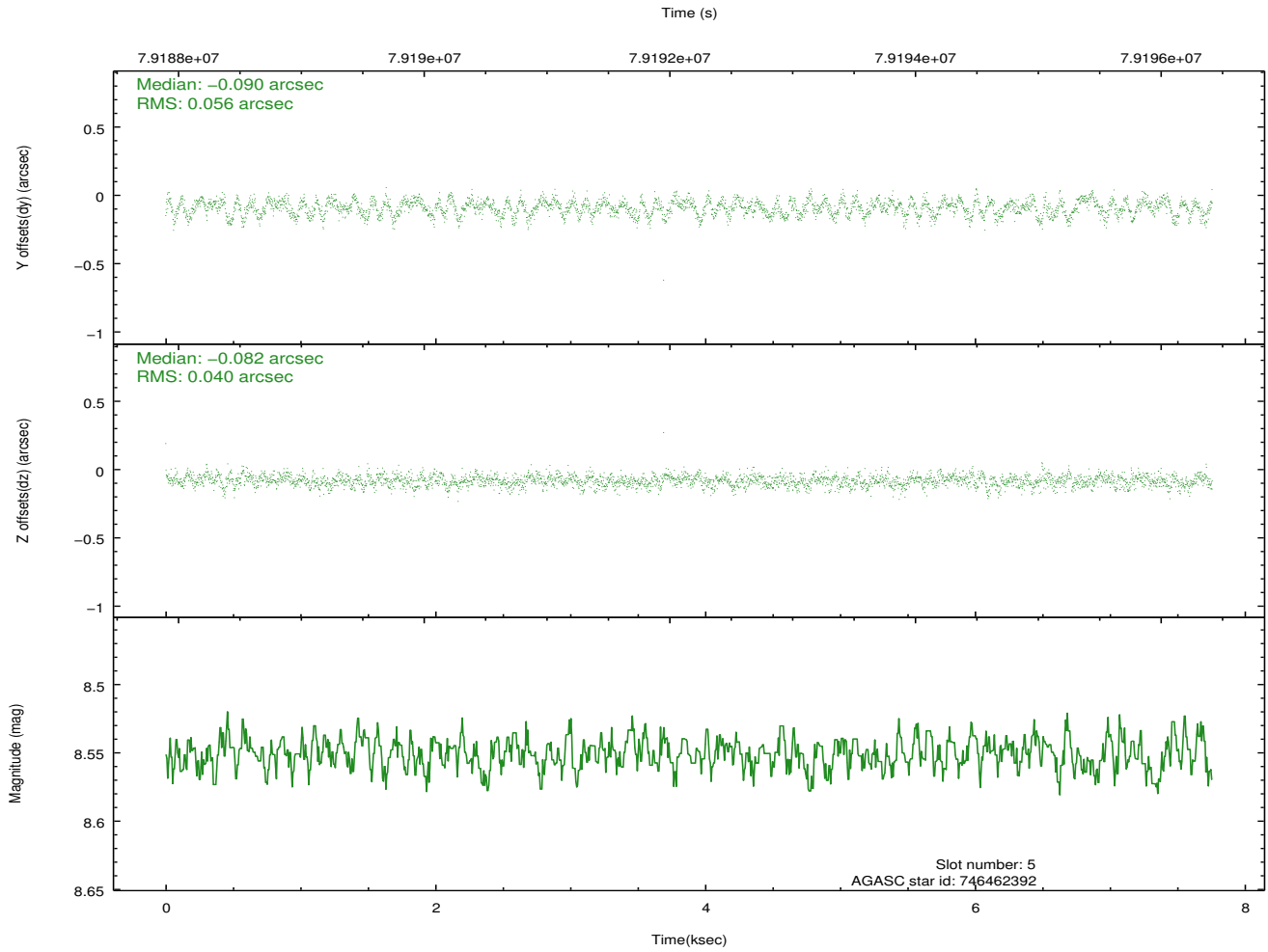
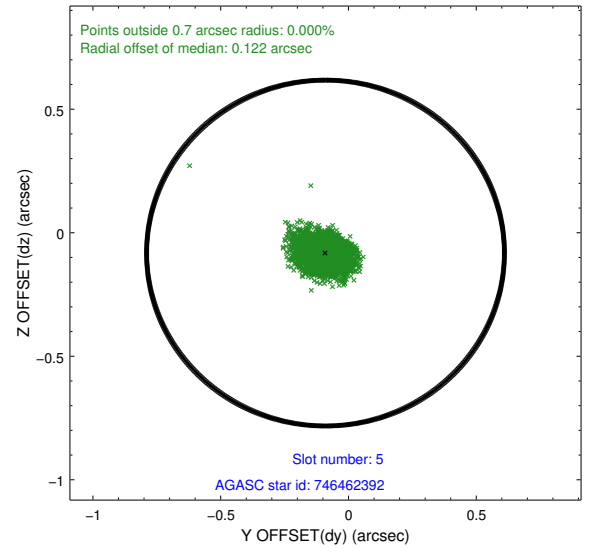
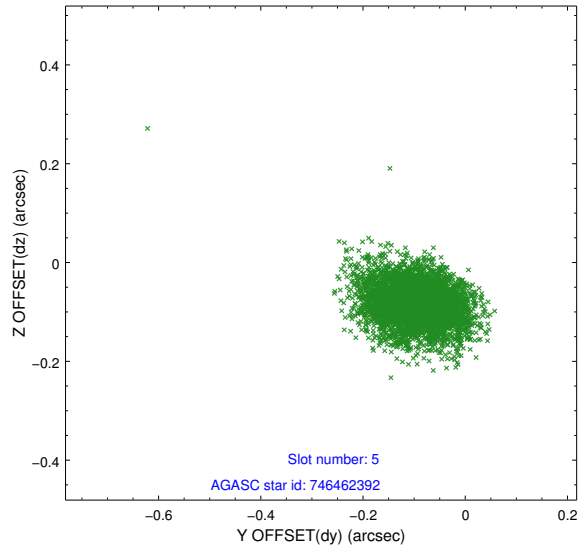
### 2.4.1 Slot 3



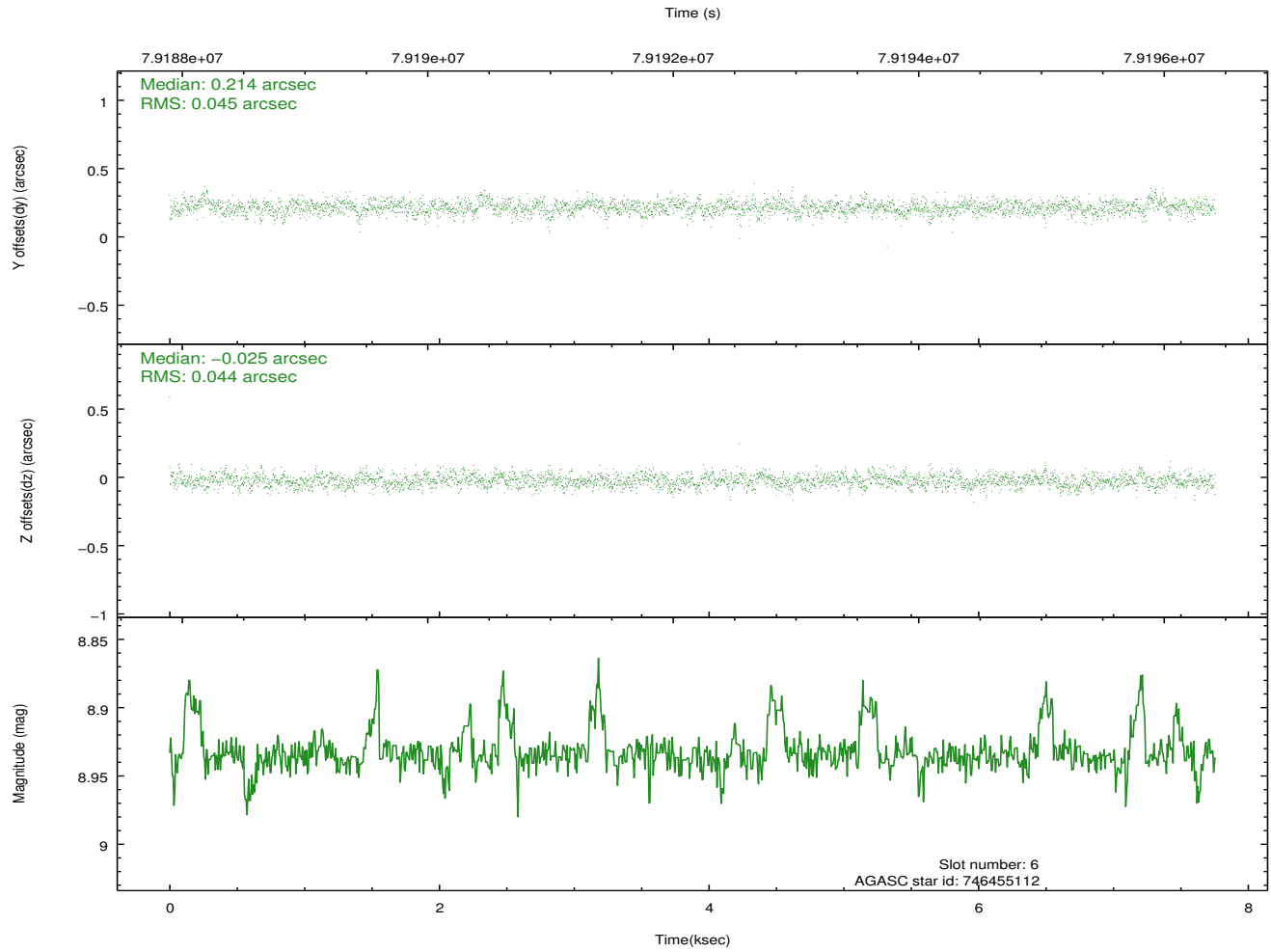
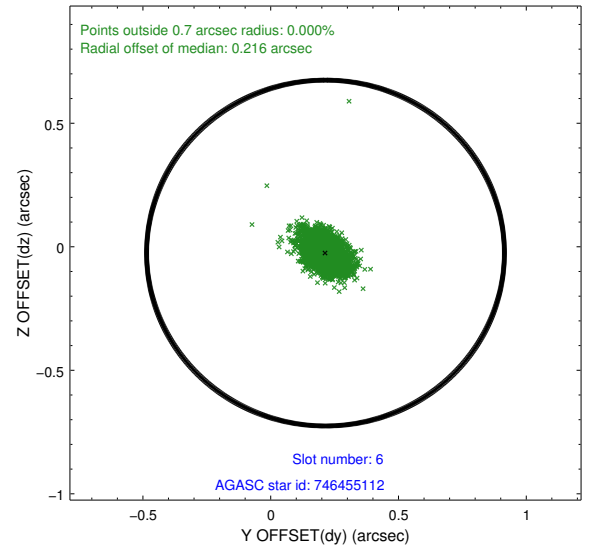
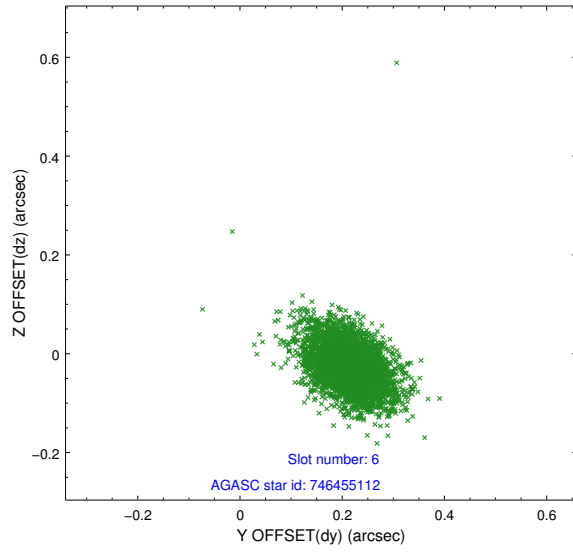
## 2.4.2 Slot 4



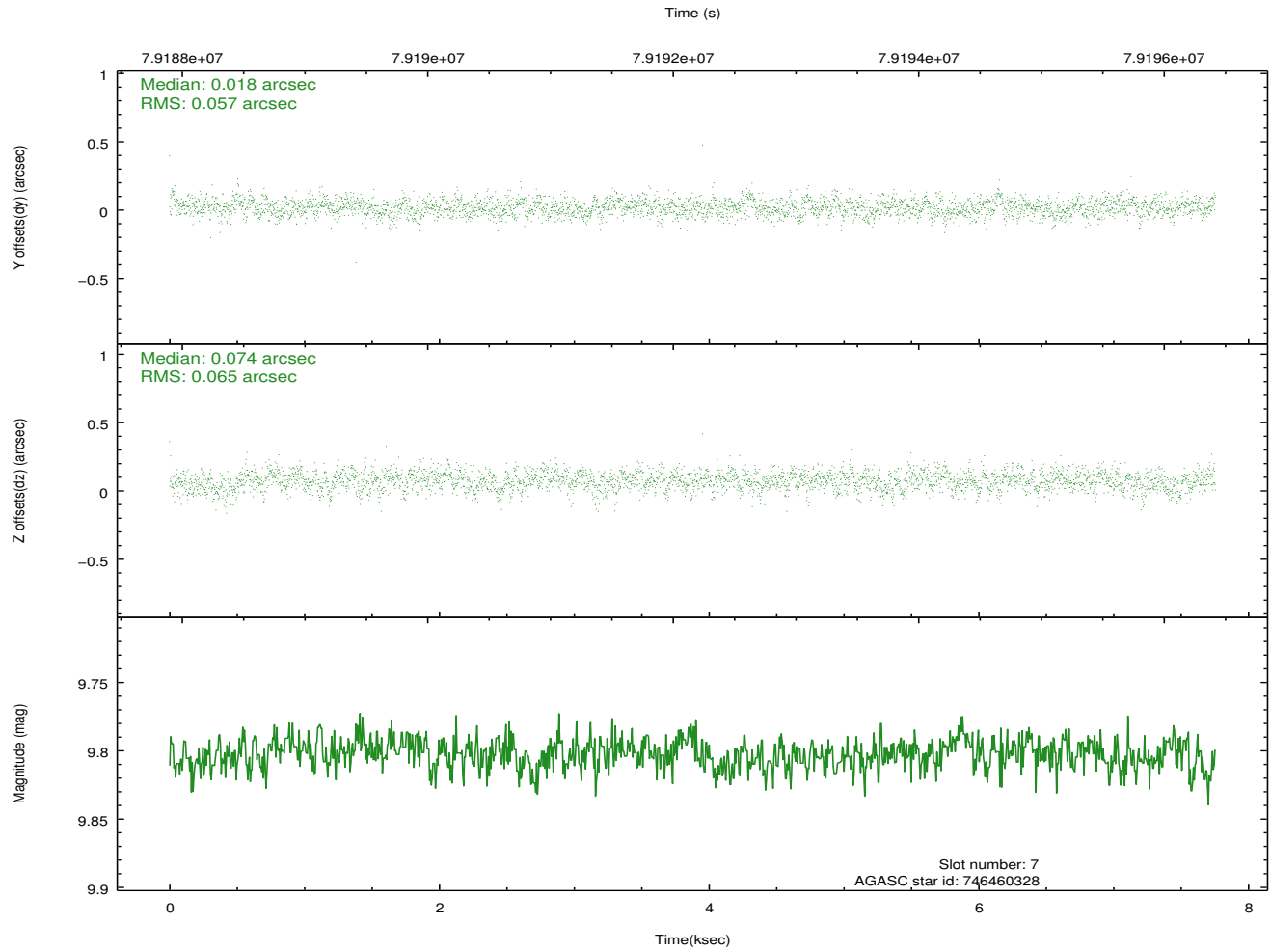
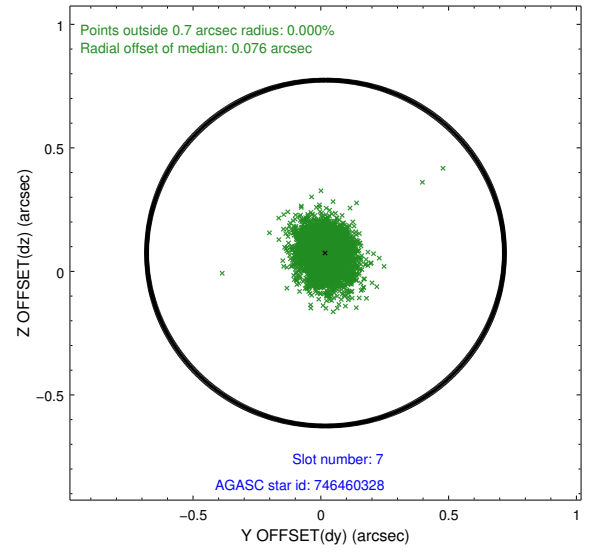
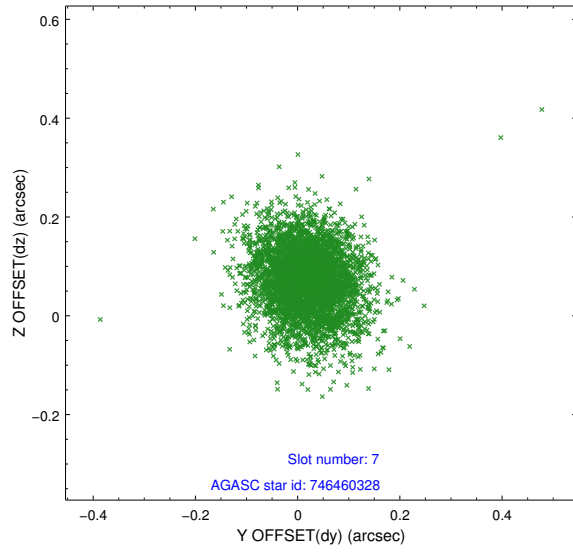
### 2.4.3 Slot 5



## 2.4.4 Slot 6

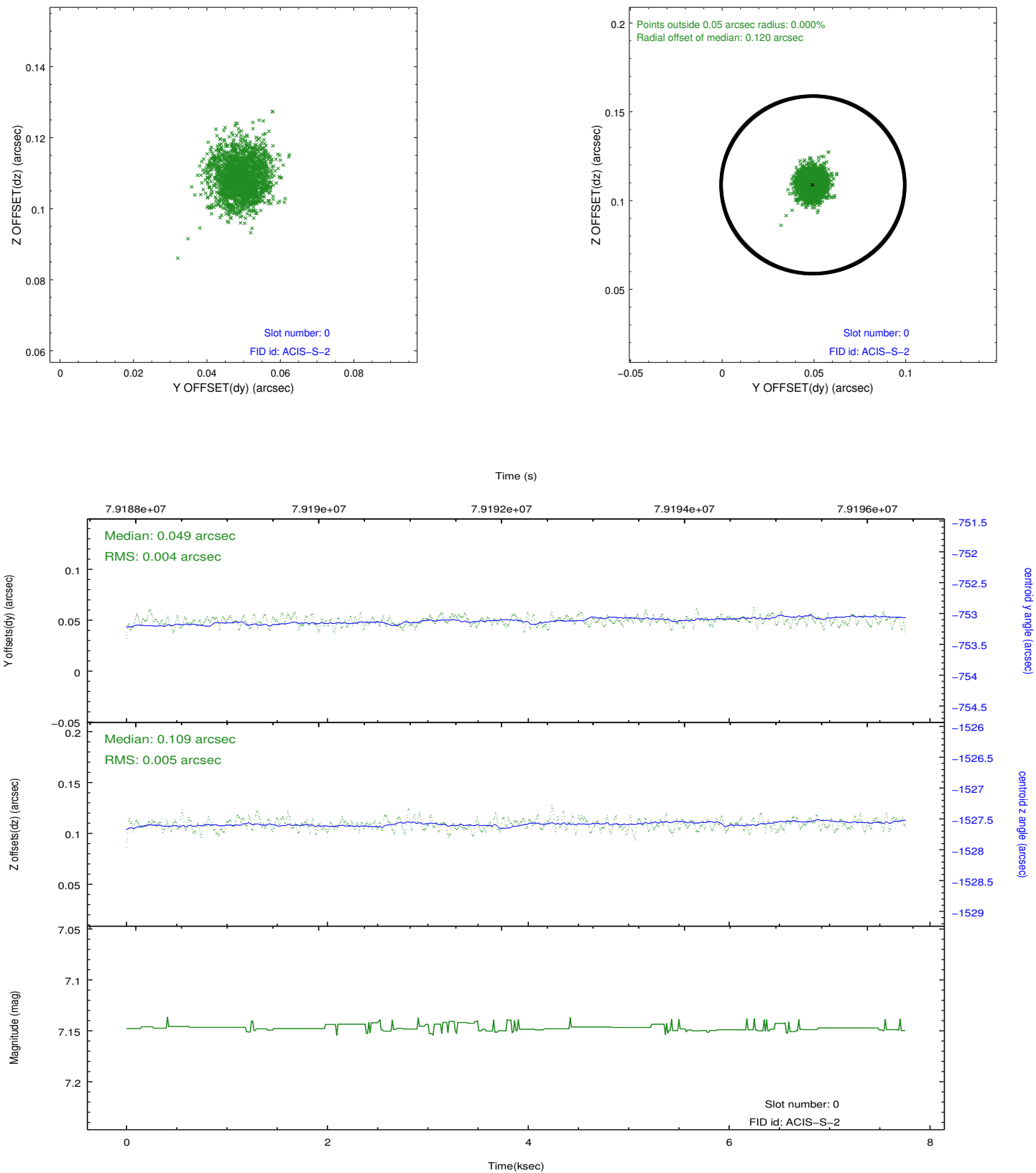


## 2.4.5 Slot 7

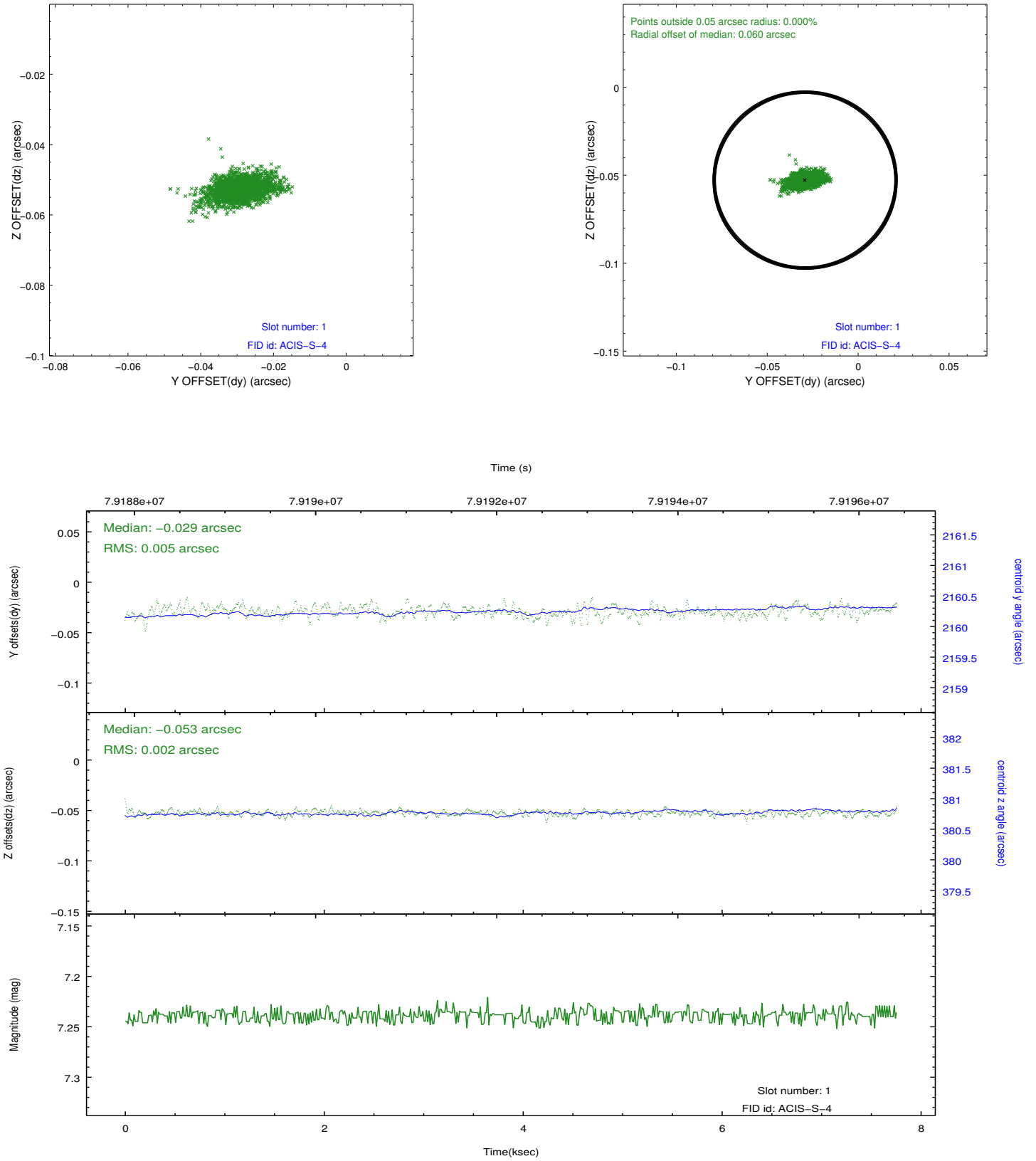


## 2.5 FID Slots

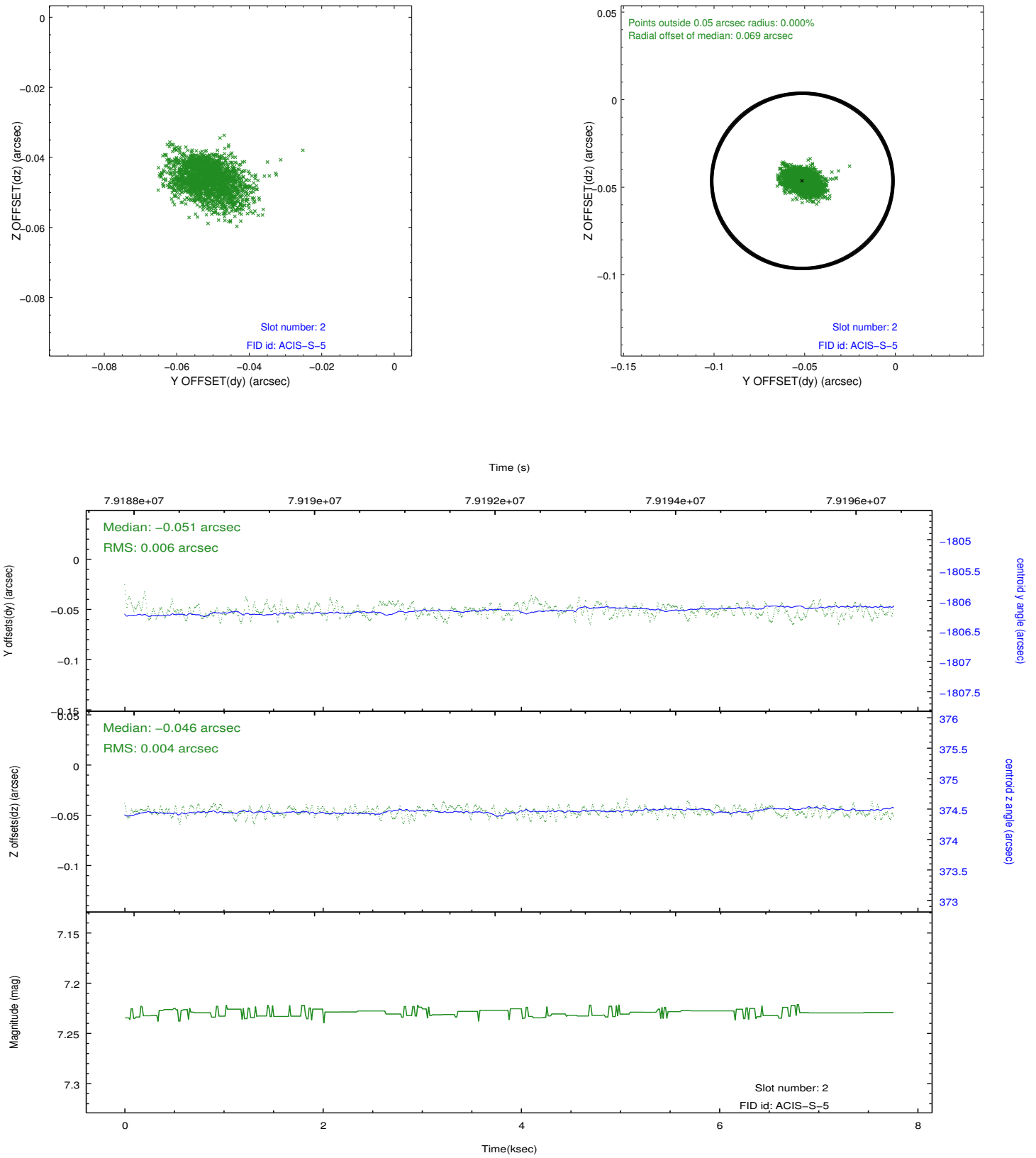
### 2.5.1 Slot 0



## 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	7.321

## 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.