

V&V Reference Report

L2 ASCDS Version : 10.7.1

Observation 22120 - L2 Version 2
Chandra X-Ray Center

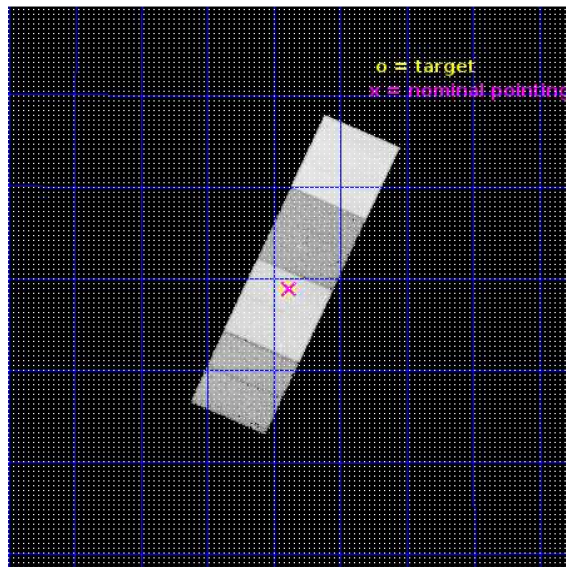
L2 Processing Date : Mar 7 2019

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1 Front

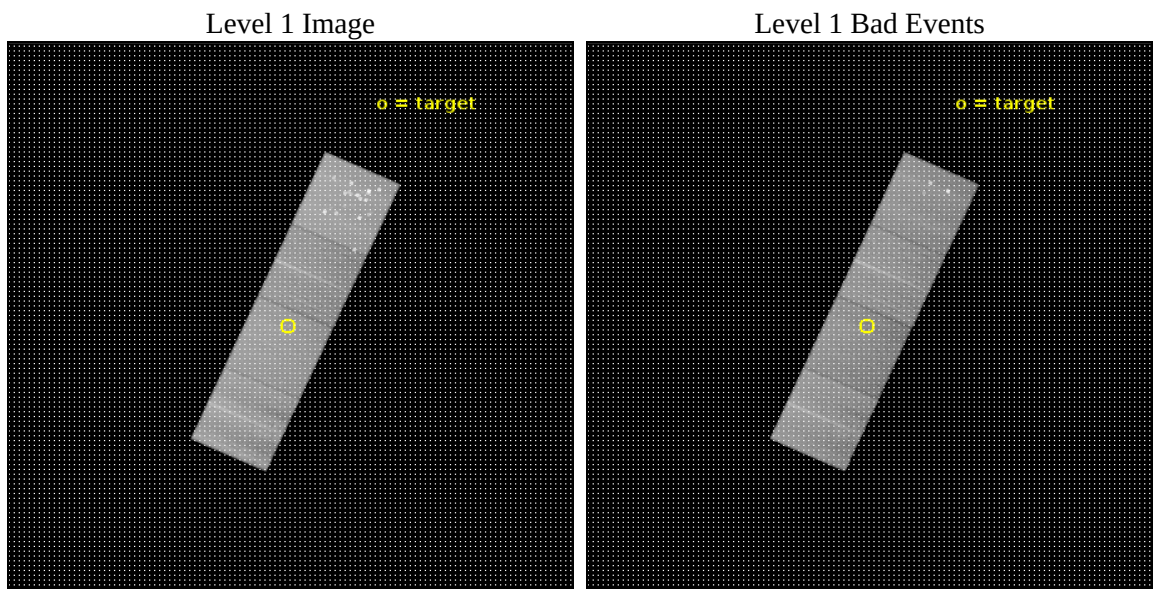
seq_num	801782	Sequence number
obs_id	22120	Observation id
title	Galaxy collisions and shocks in compact groups	Proposal title
observer	Ewan O'Sullivan	Principal investigator
object	HCG57	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	174.475	Observer's specified target RA [deg]
dec_targ	21.981389	Observer's specified target Dec [deg]
ra_nom	174.47078121339	Nominal RA [deg]
dec_nom	21.981599147672	Nominal Dec [deg]
roll_nom	114.15819161292	Nominal Roll [deg]
revision	2	Processing version of data
ontime	40199.472317815	Sum of GTIs [s]
livetime	39674.236617562	Livetime [s]
ontime5	40199.431277871	Sum of GTIs [s]
ontime6	40196.24909699	Sum of GTIs [s]
ontime7	40199.472317815	Sum of GTIs [s]
ontime8	40193.067067385	Sum of GTIs [s]
l2events	458249	Number of level 2 events



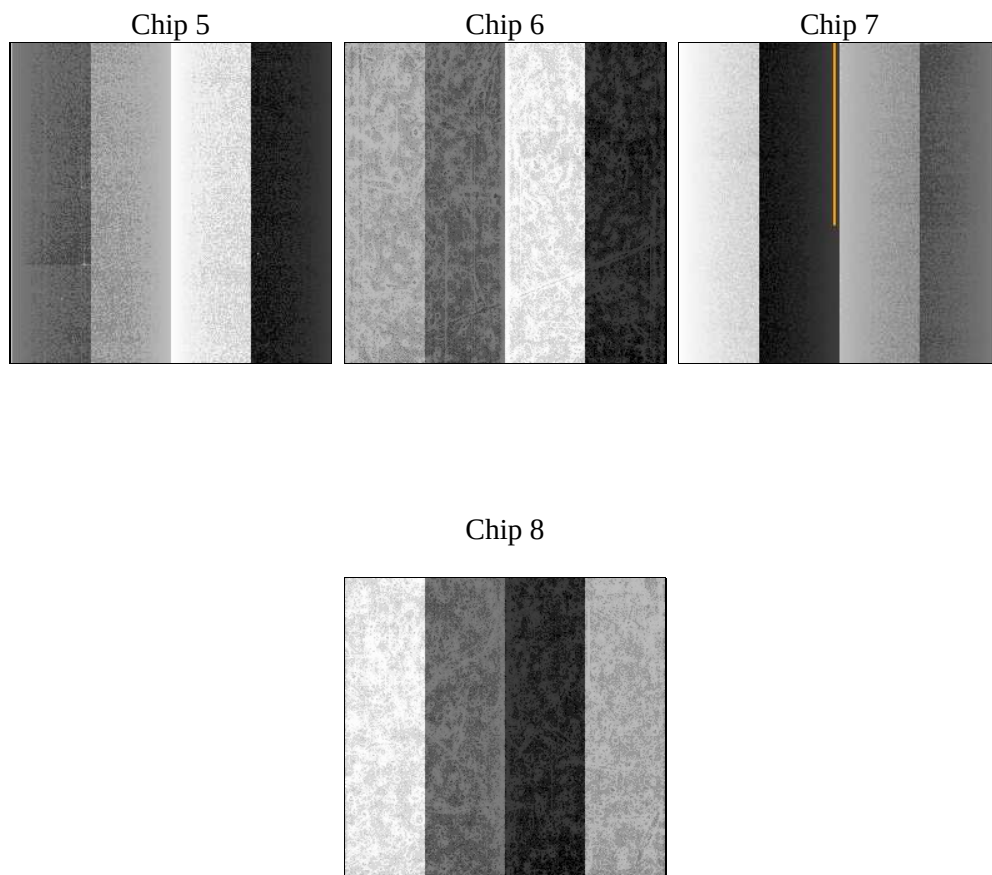
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	40135.000000	[s] Scheduled observation exposure time
ascdsver	10.7.1	Processing system revision	ontime	40199.472317815	Sum of GTIs [s]
caldsver	4.8.2	 	ontime5	40199.431277871	Sum of GTIs [s]
date	2019-03-07T22:50:04	Date and time of file creation	ontime6	40196.24909699	Sum of GTIs [s]
revision	2	Processing version of data	ontime7	40199.472317815	Sum of GTIs [s]
			ontime8	40193.067067385	Sum of GTIs [s]
			l1events	1739513	Number of level 1 events

2.1.4 Events

	ccd 5	ccd 6	ccd 7	ccd 8
level 1 events	602940	324138	401929	410506
rejected events	281142	288966	228767	303346
rejected %	46%	89%	56%	73%

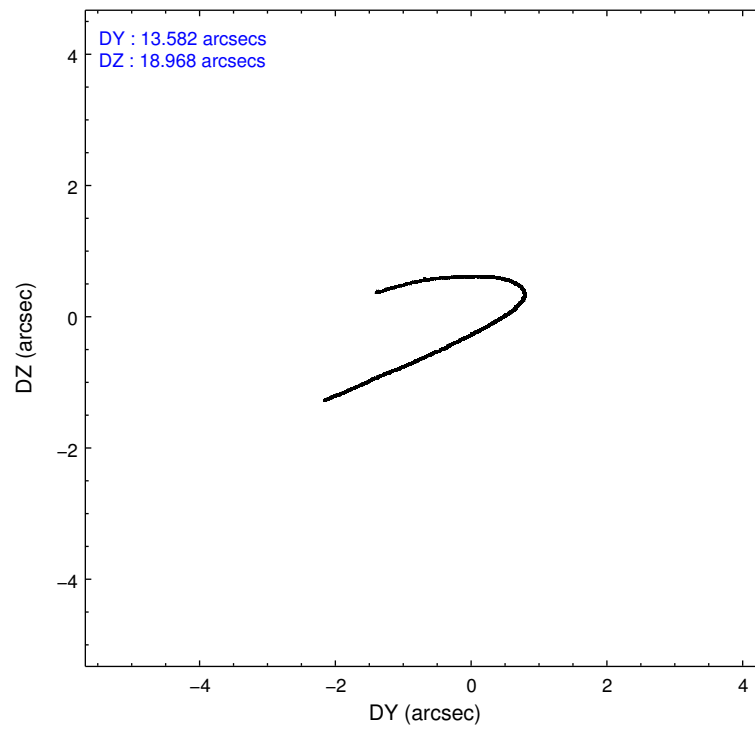
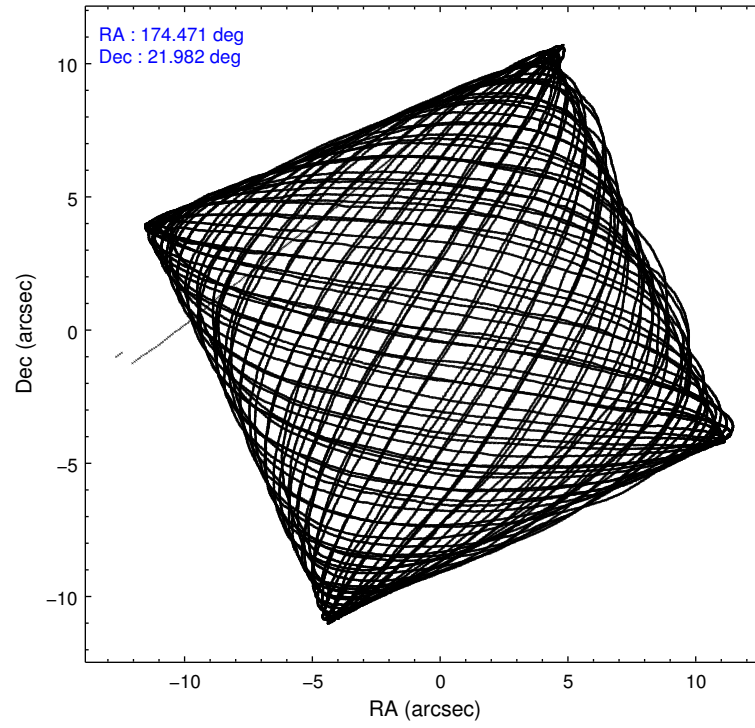
	ccd 5	ccd 6	ccd 7	ccd 8
grade 0 events	81460	10866	14508	29676
	13%	3%	3%	7%
grade 1 events	1338	188	663	302
	0%	0%	0%	0%
grade 2 events	88343	8987	36736	26224
	14%	2%	9%	6%
grade 3 events	8533	3153	13507	11029
	1%	0%	3%	2%
grade 4 events	9331	3105	13099	10477
	1%	0%	3%	2%
grade 5 events	35857	13703	39208	21595
	5%	4%	9%	5%
grade 6 events	134196	9067	95335	29764
	22%	2%	23%	7%
grade 7 events	243882	275069	188873	281439
	40%	84%	46%	68%

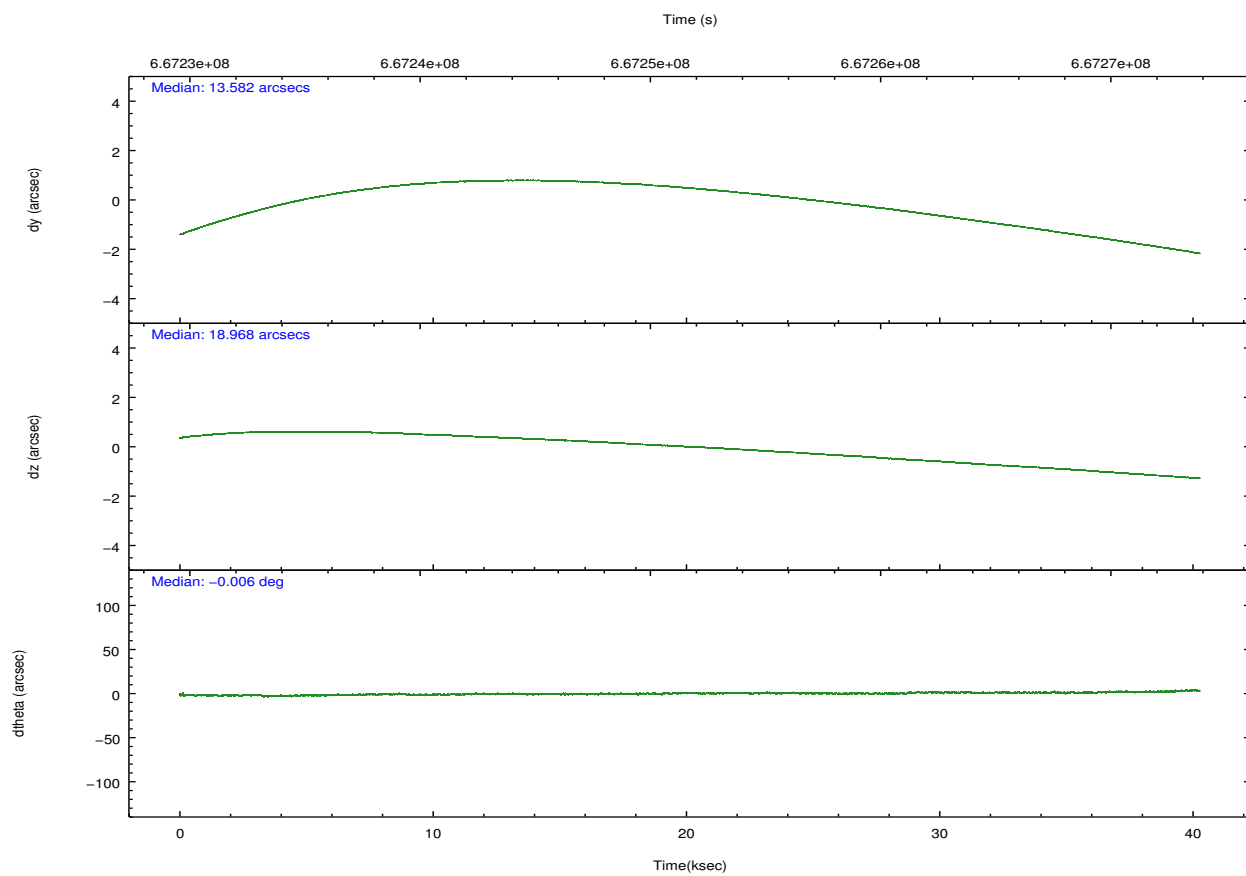
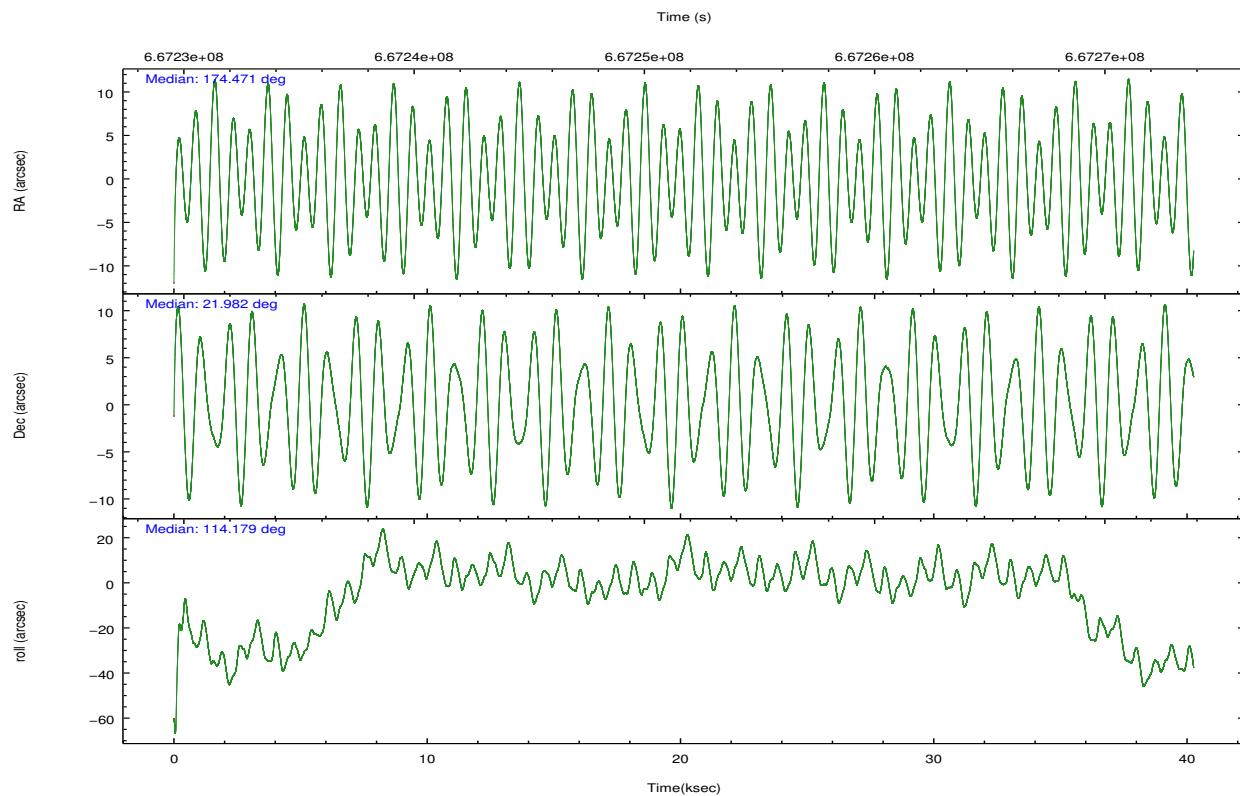
2.2 Compared Parameters

Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-5678	ACIS-5678
Grating	NONE	NONE
Data mode	VFAINT	VFAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	174.495004	174.4707812133929
[deg] Pointing Dec	21.965820	21.98159914767163
[deg] Pointing Roll	113.992515	114.1581916129242
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-190.132523	-190.1400660498719
[mm] SIM translation stage offset	0	0.00754346686406393
[s] Observation start time (MET)	667231716.184000	667230393.8209701
Observation start date	2019-02-22T14:07:27	2019-02-22T13:46:33
[s] Observation end time (MET)	667271851.184000	667272931.3235101
Observation end date	2019-02-23T01:16:22	2019-02-23T01:35:31
Read mode	TIMED	TIMED

Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
CCD I0 on	N	N
CCD I1 on	N	N
CCD I2 on	O1	N
CCD I3 on	O2	N
CCD S0 on	N	N
CCD S1 on	Y	Y
CCD S2 on	Y	Y
CCD S3 on	Y	Y
CCD S4 on	Y	Y
CCD S5 on	N	N
Number of optional ACIS chips dropped	2	2
On-chip summing requested	N	N
Subarray requested	NONE	NONE
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	3.1

2.3 Aspect



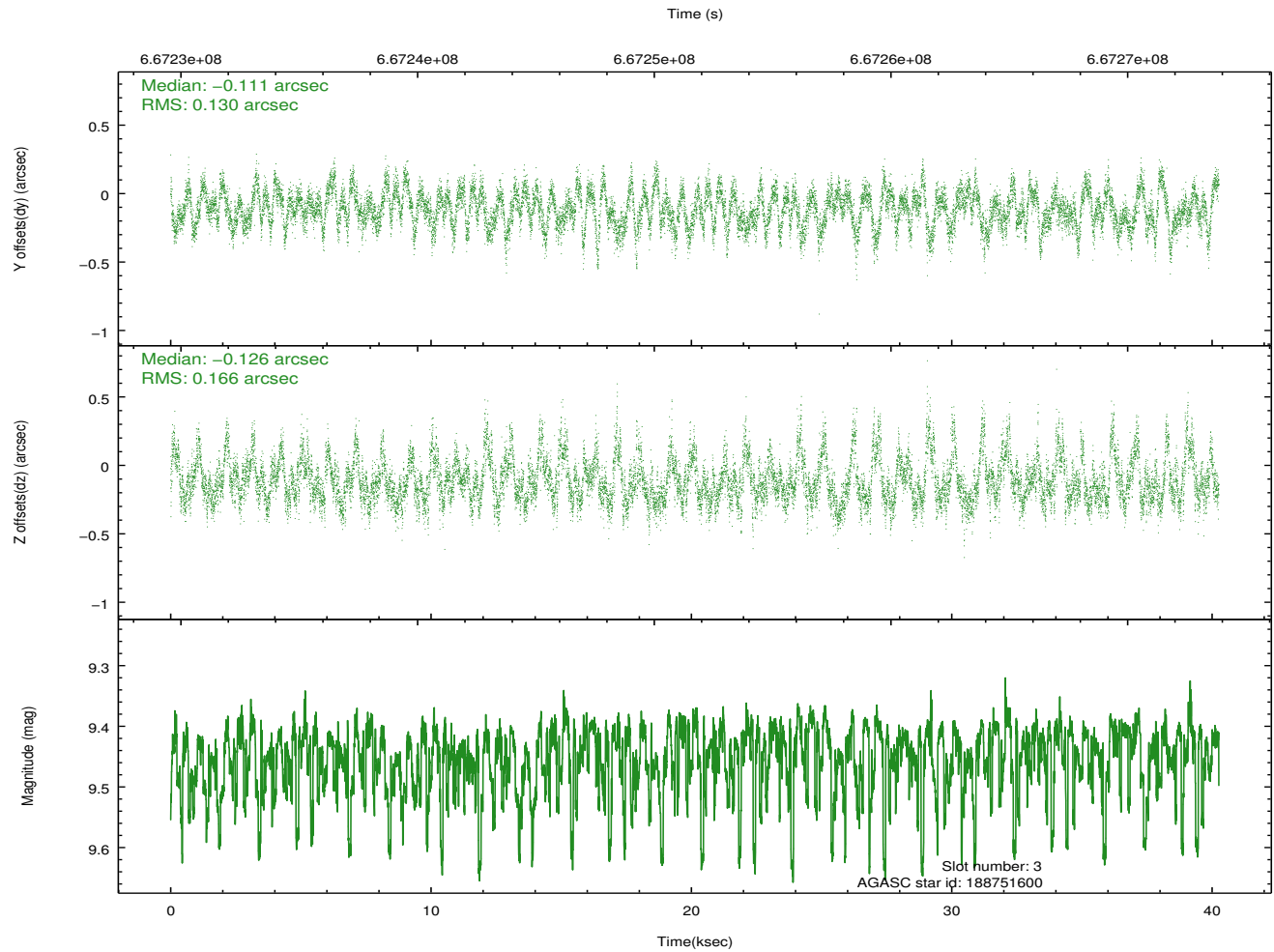
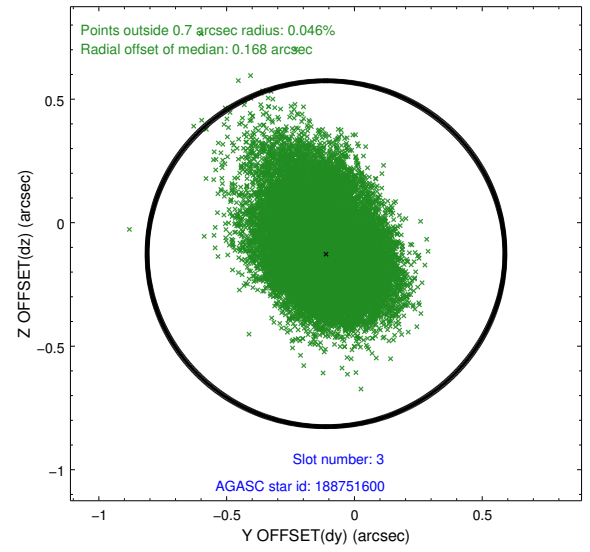
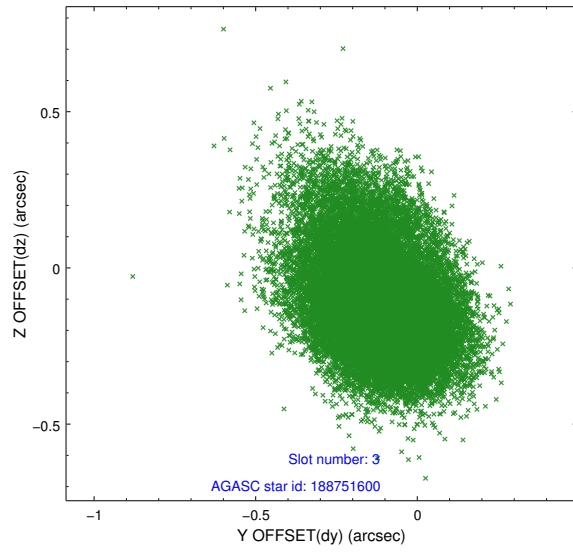


Slot Statistics

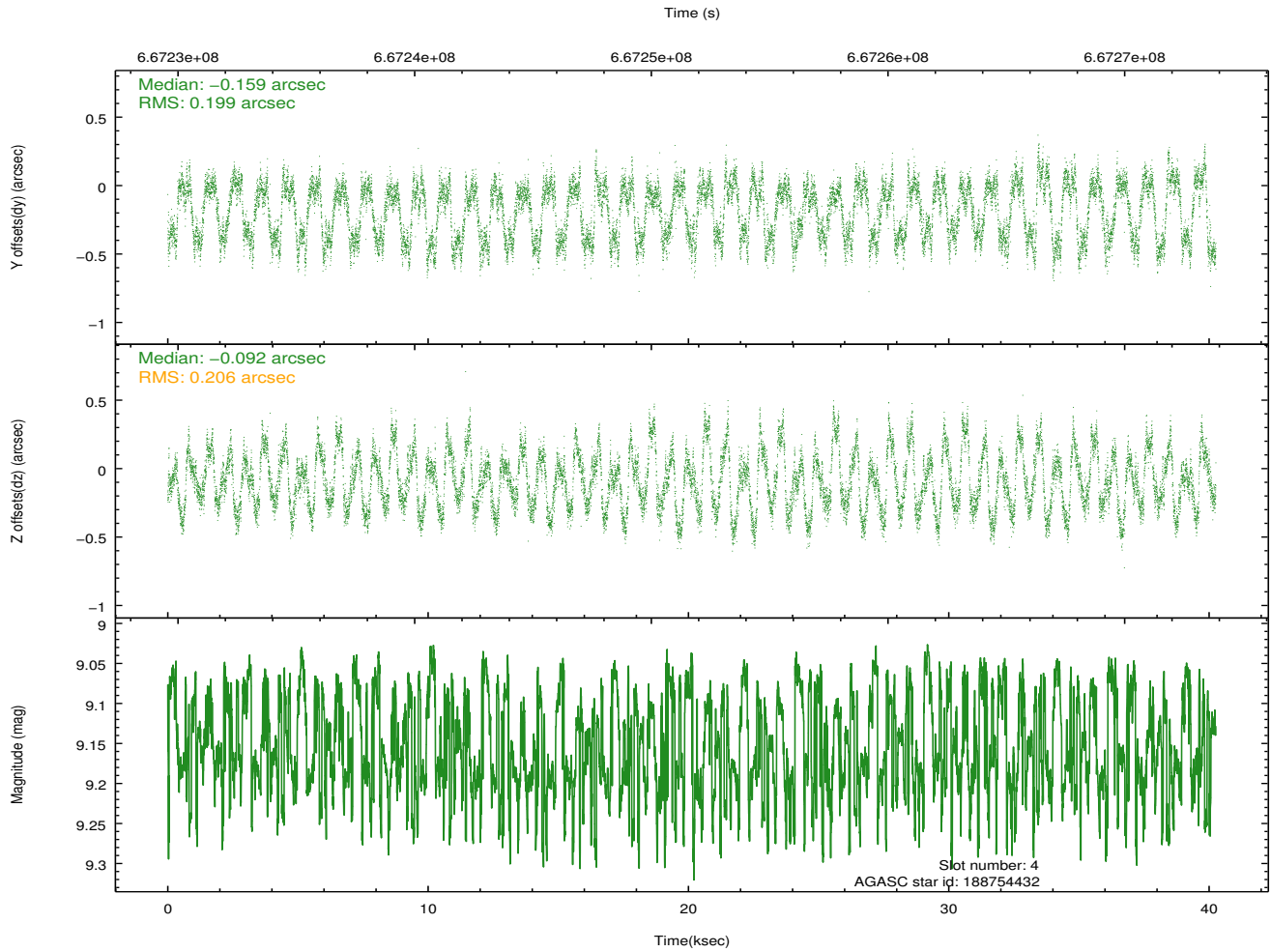
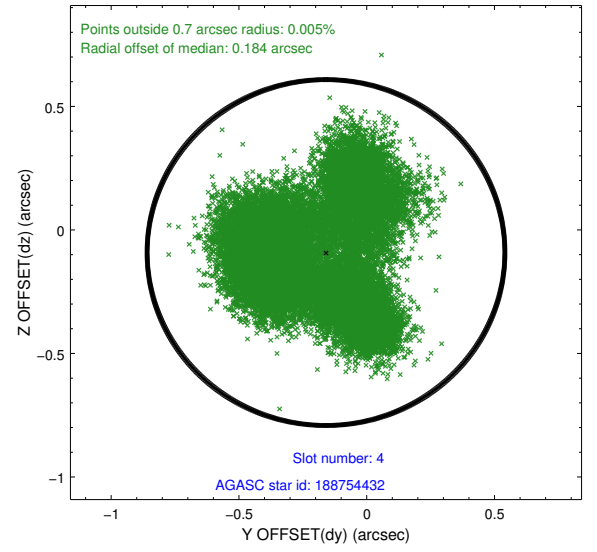
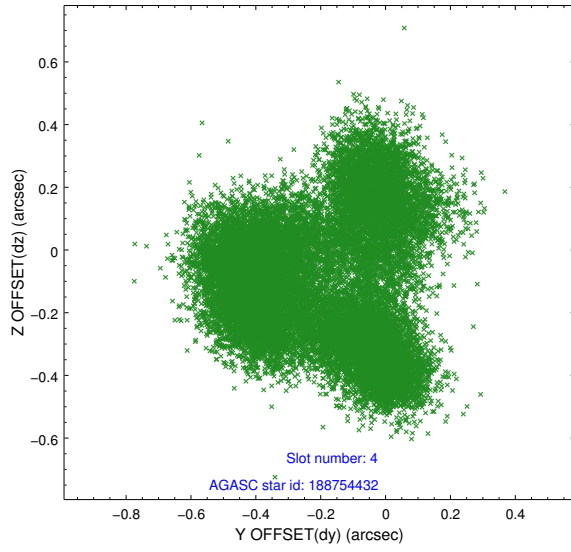
pt	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mea
0	FID		ACIS-S-2	7.03	9820	1.000	-0.285	-0.192	0.035	0.048	0.000000	0.000000	-766.52	-1740
1	FID		ACIS-S-4	7.15	9818	1.000	0.761	0.190	0.037	0.077	0.000000	0.000000	2147.71	168
2	FID		ACIS-S-5	7.12	9820	1.000	-0.498	0.011	0.028	0.043	0.000000	0.000000	-1819.62	161
3	GUIDE	used	188751600	9.45	19605	1.000	-0.111	-0.126	0.218	0.369	174.166921	21.601986	-749.03	1536
4	GUIDE	used	188754432	9.16	19618	1.000	-0.159	-0.092	0.317	0.429	174.164183	22.388902	1840.40	385
5	GUIDE	used	188758704	8.37	19625	1.000	0.133	-0.069	0.194	0.304	174.474570	21.745106	-697.38	385
6	GUIDE	used	188760112	7.75	19638	1.000	0.044	0.265	0.188	0.278	174.548855	21.871657	-382.52	-25
7	GUIDE	used	188760296	9.11	19619	1.000	0.121	-0.041	0.126	0.212	174.426696	21.691710	-808.11	610

2.4 Star Slots

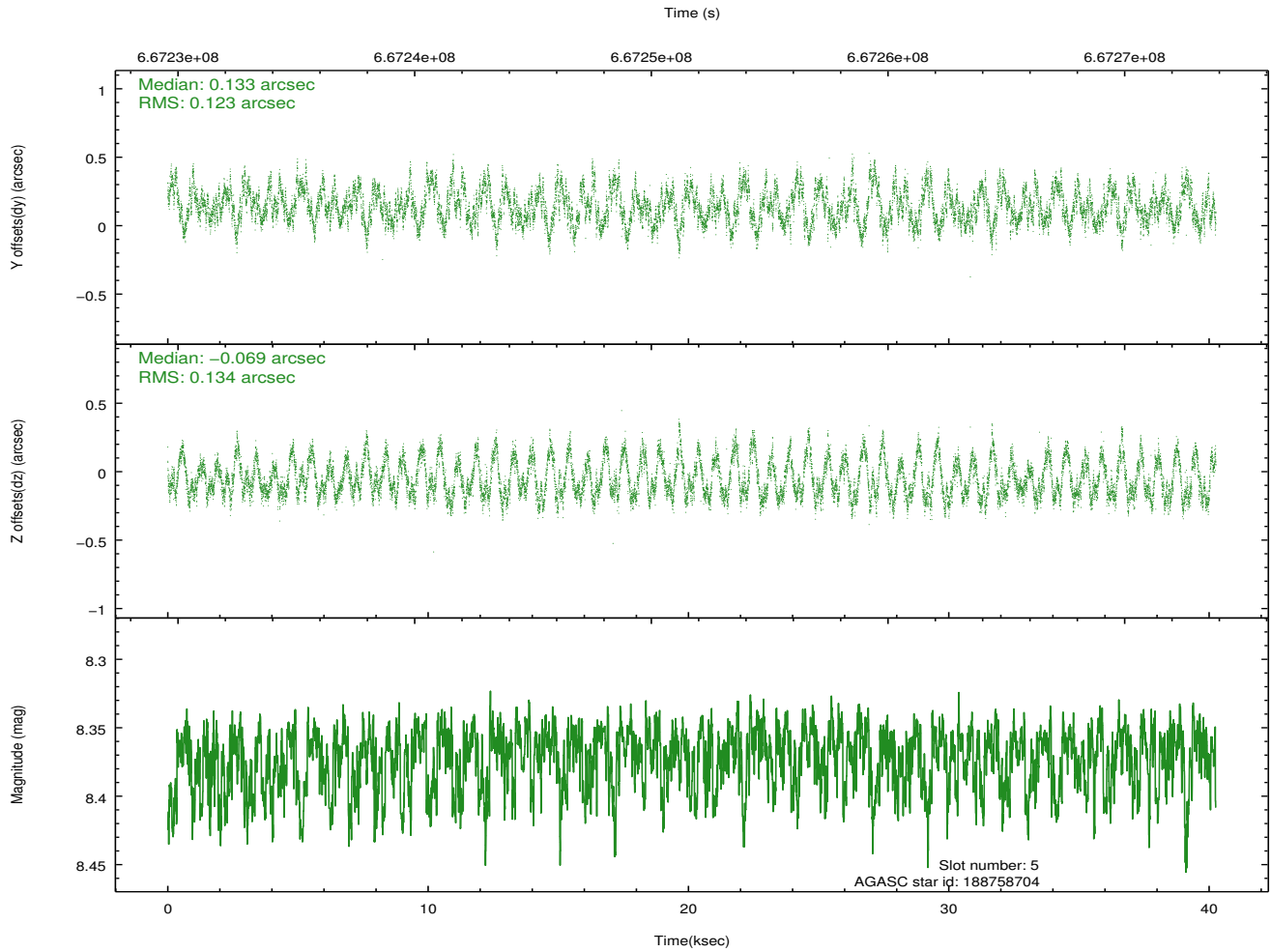
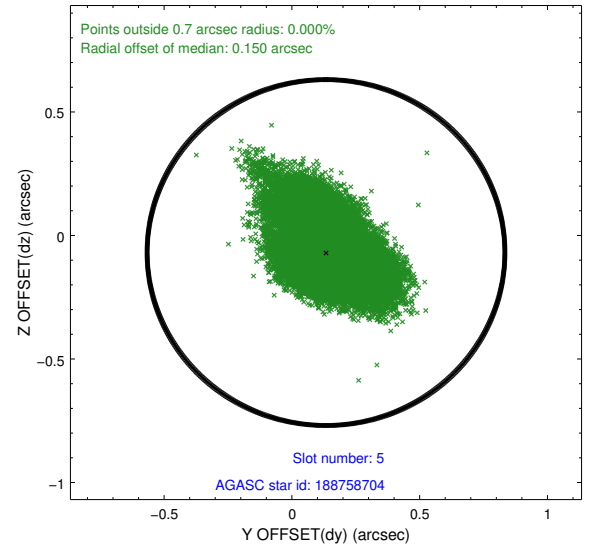
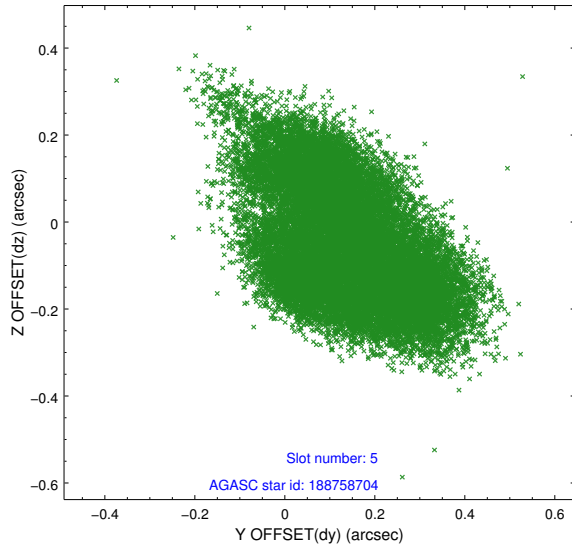
2.4.1 Slot 3



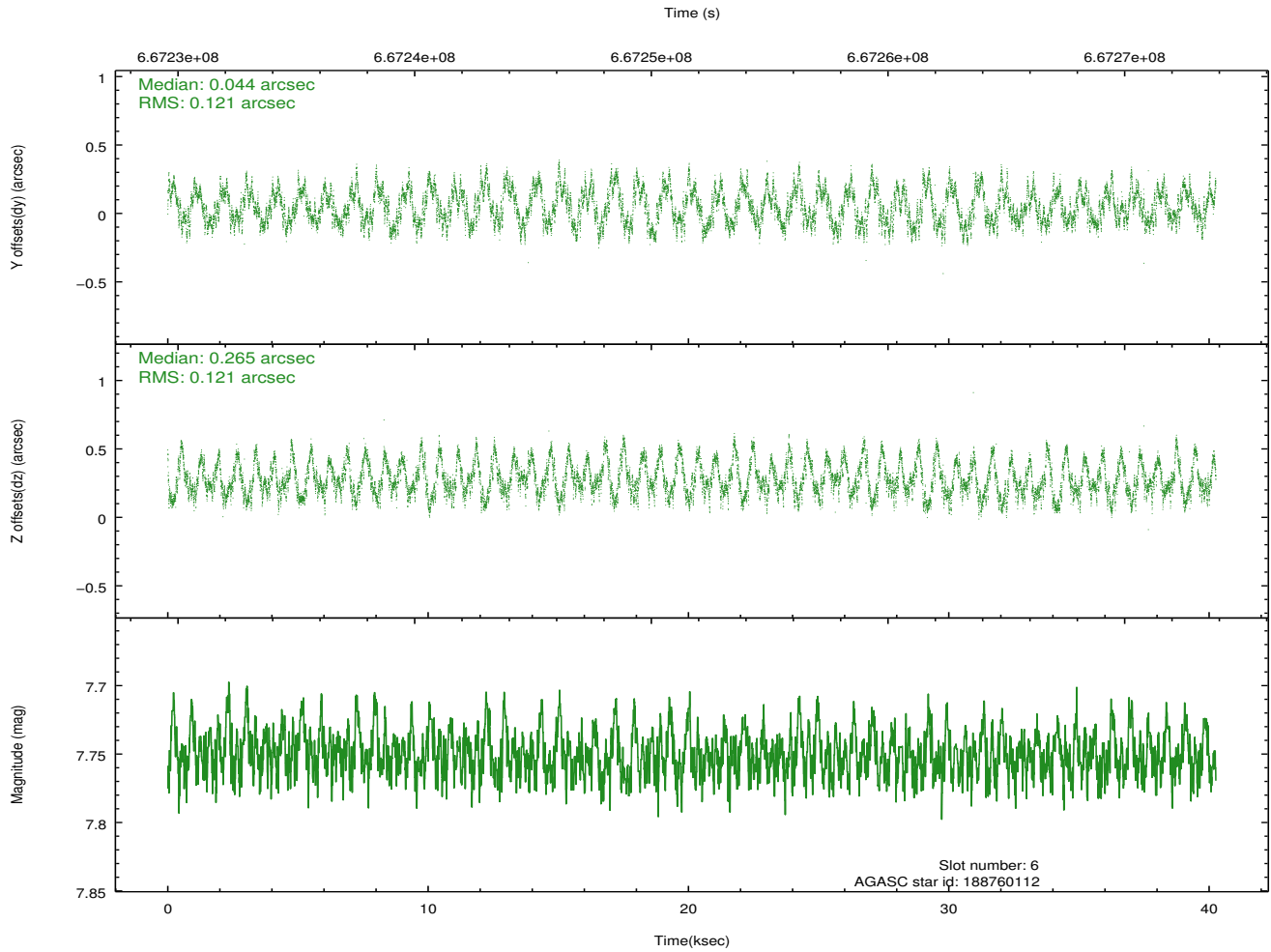
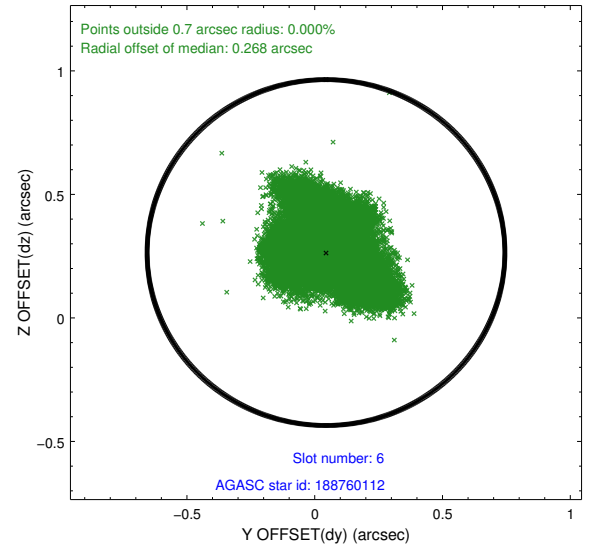
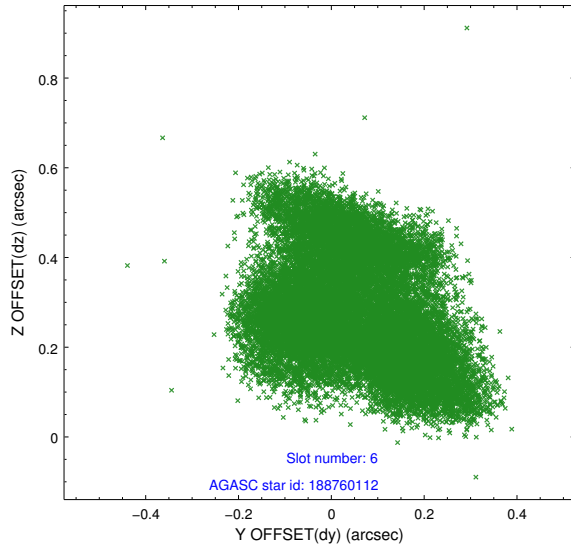
2.4.2 Slot 4



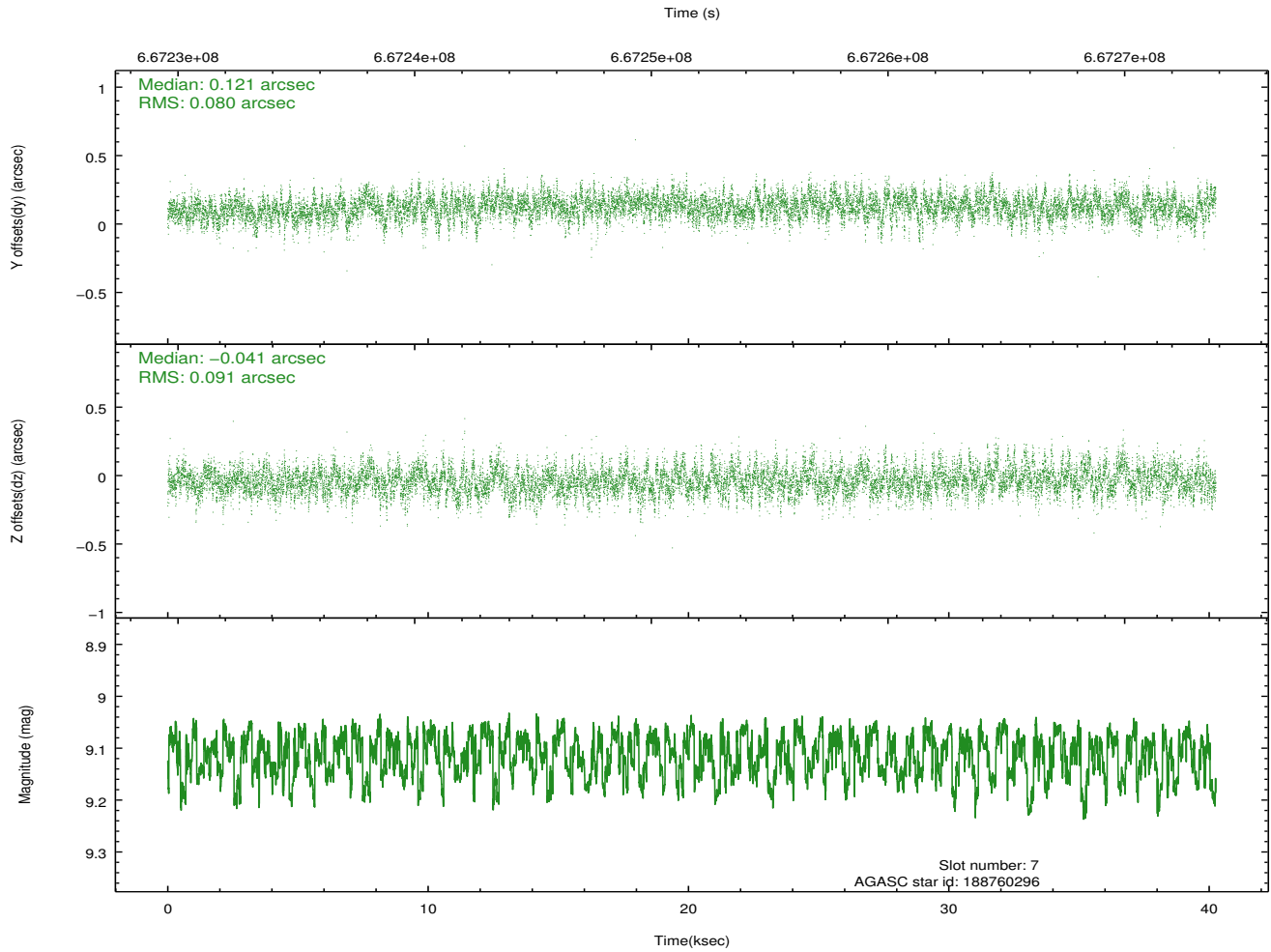
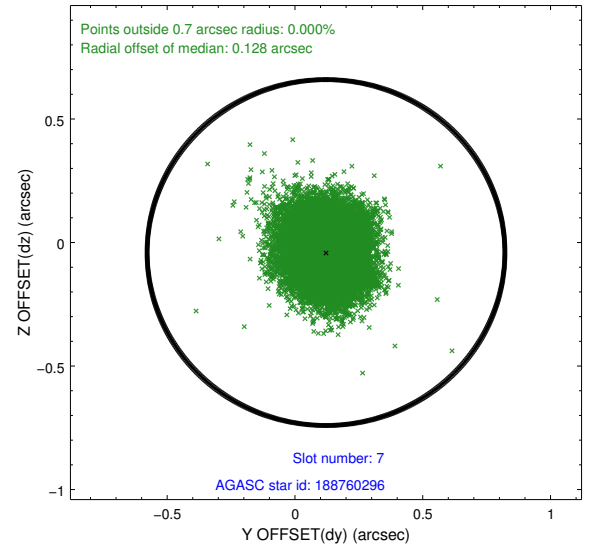
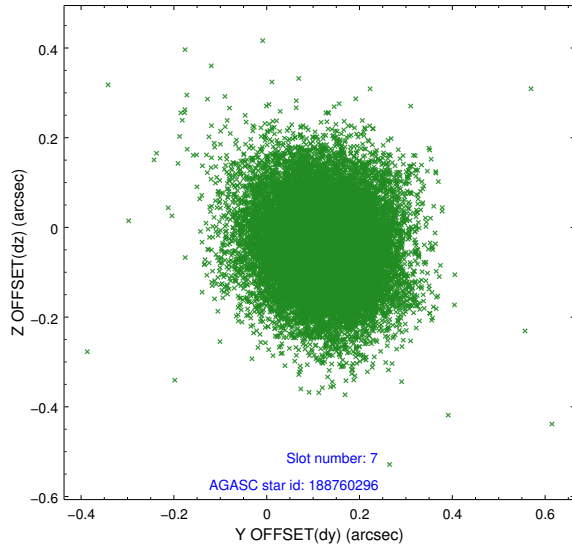
2.4.3 Slot 5



2.4.4 Slot 6

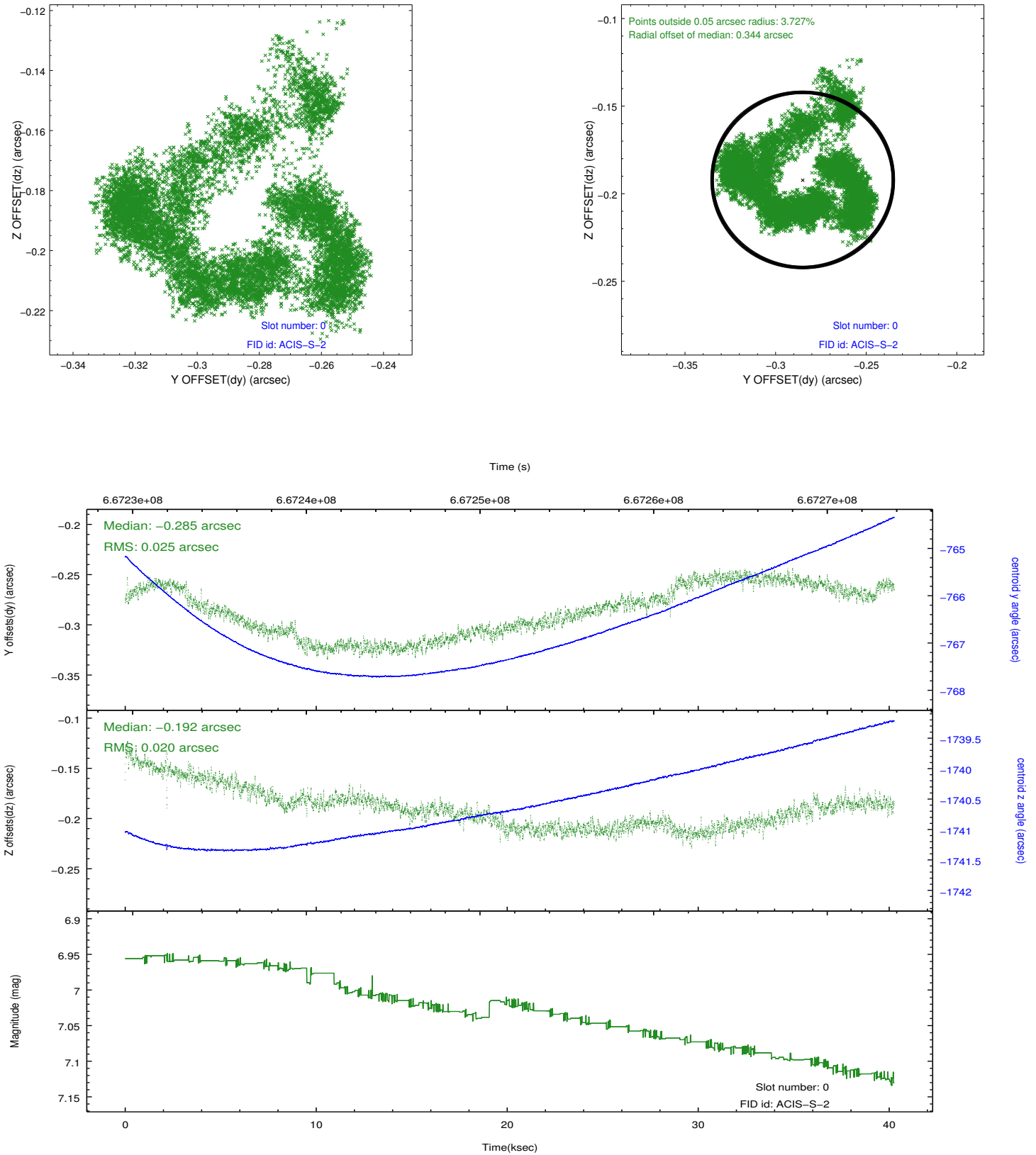


2.4.5 Slot 7

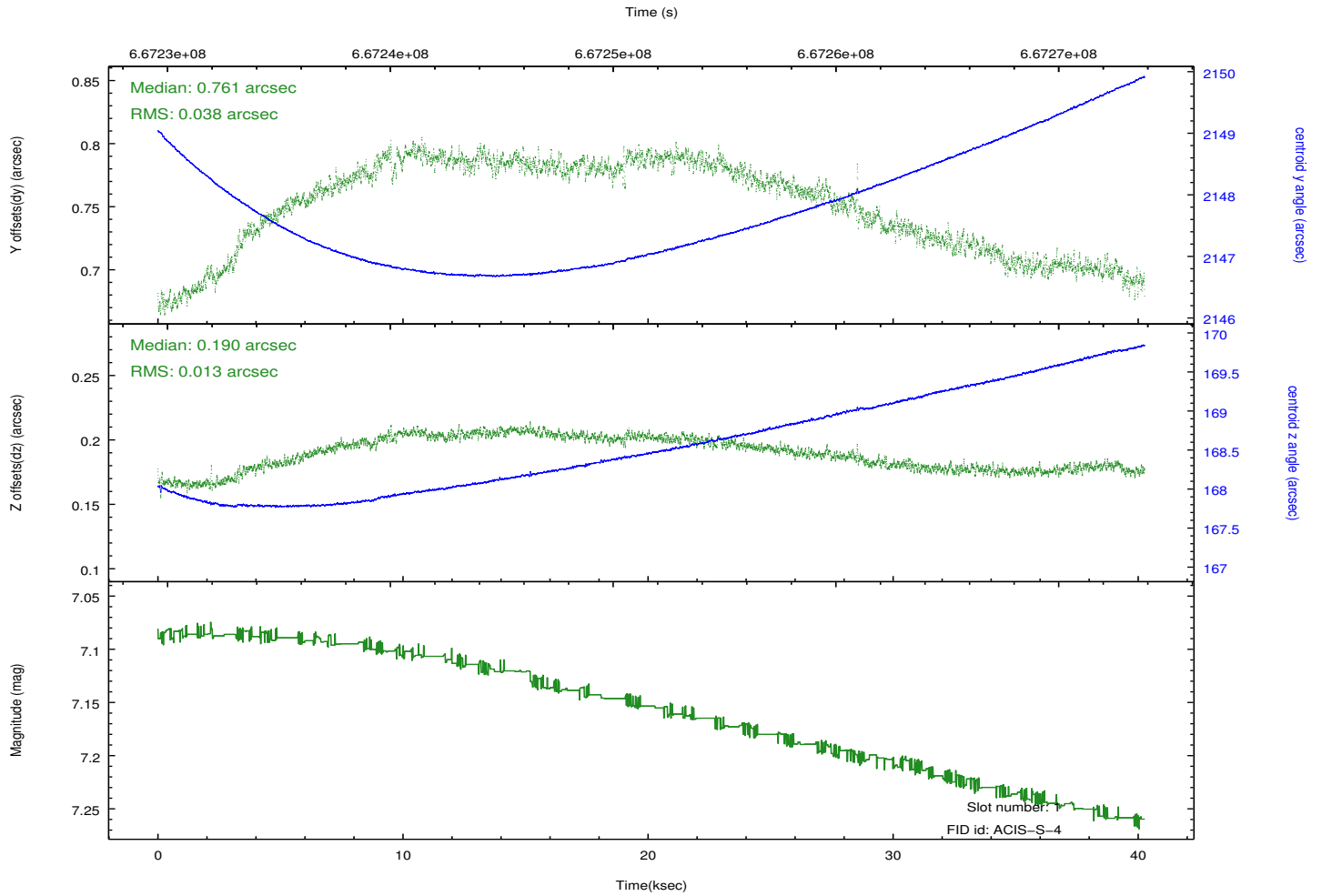
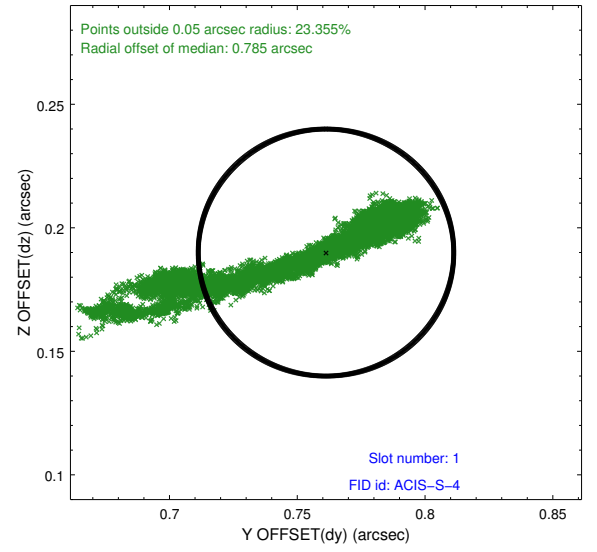
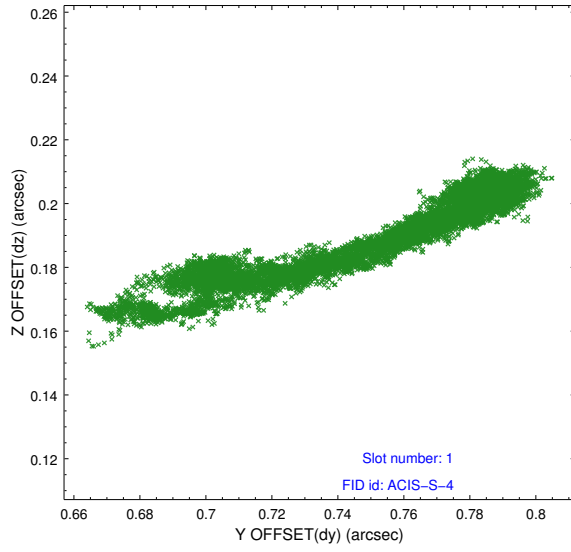


2.5 FID Slots

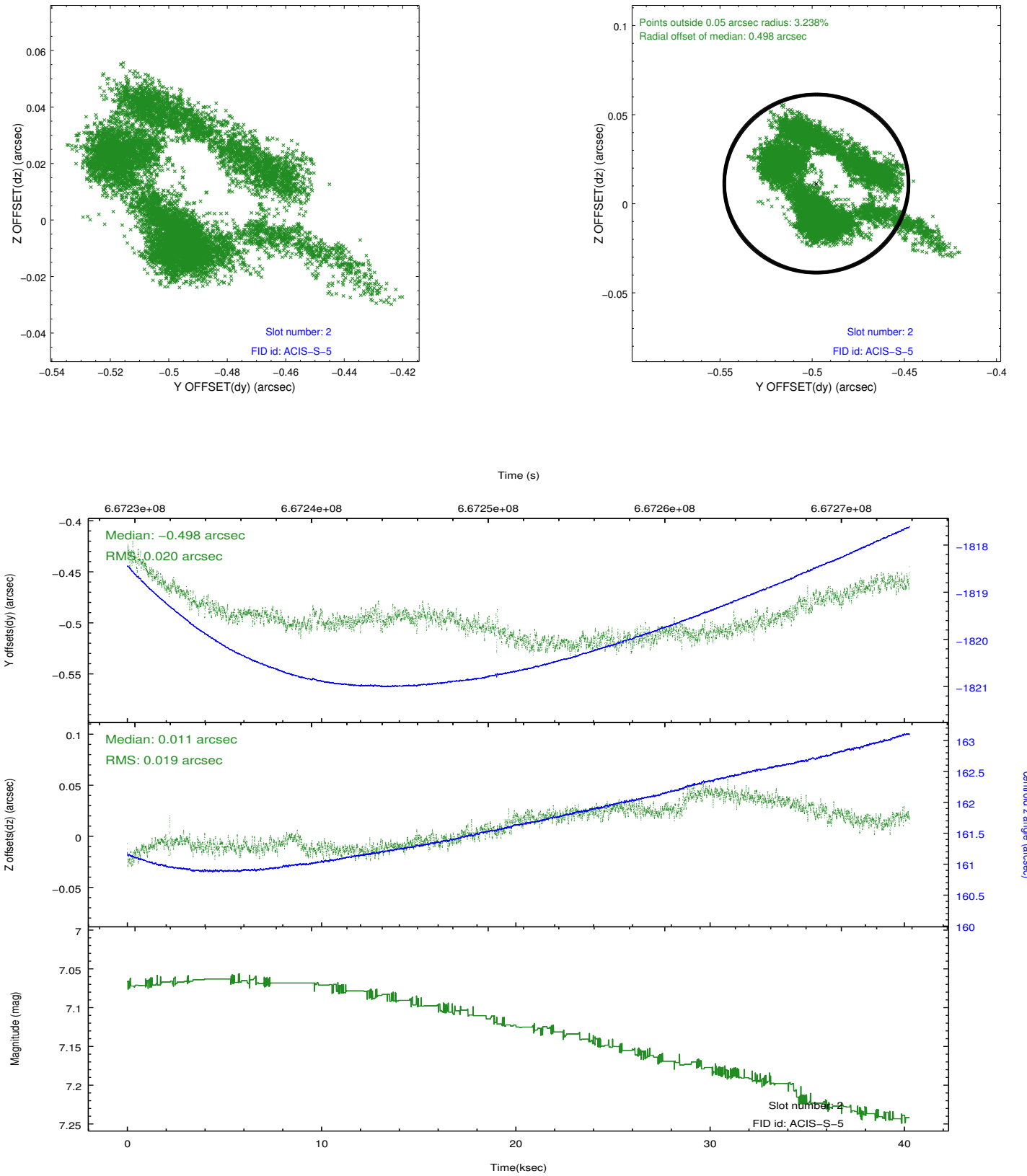
2.5.1 Slot 0



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)	2019.03.08
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	40.199472317815

A.2 Comments

Joint proposal with XMM. Roll preference met. Optional chips I2 and I3 not included.

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To compensate for a few bad pixels not marked as bad that were not removed in the Level 2 processing, a custom bad pixel file with additional bad pixels at (chipx, chipy) = (232:234,322:339) in S1 was added in this processing. As a result, the user will NOT find a relatively bright square of pixels on the S1 chip for level 2 data caused by the application of the dither algorithm to the bad pixels in question, as opposed to previous processing(s).

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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.