

V&V Reference Report

L2 ASCDS Version : 8.4.3

Observation 12831 - L2 Version 2
Chandra X-Ray Center

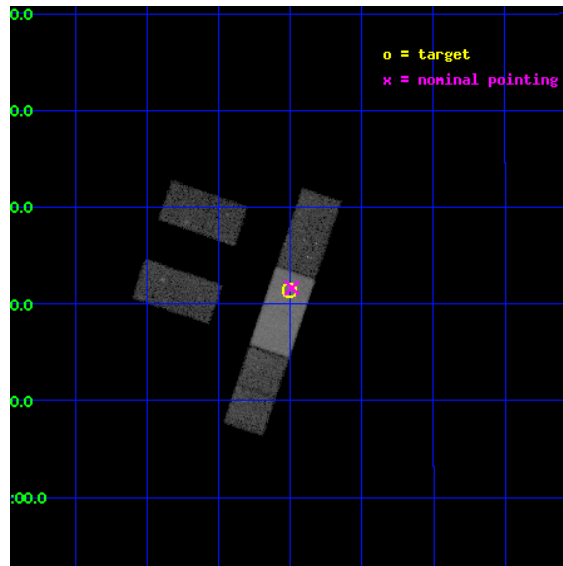
L2 Processing Date : Feb 10 2012

Contents

1	Front	2
2	OBI	3
2.1	OBI	3
2.1.1	Images	3
2.1.2	Bias	3
2.1.3	Parameters	4
2.1.4	Events	4
2.2	Compared Parameters	5
2.3	Aspect	6
2.4	Star Slots	9
2.4.1	Slot 3	9
2.4.2	Slot 4	10
2.4.3	Slot 5	11
2.4.4	Slot 6	12
2.4.5	Slot 7	13
2.5	FID Slots	14
2.5.1	Slot 0	14
2.5.2	Slot 1	15
2.5.3	Slot 2	16
A	Summary	17
A.1	Status	17
A.2	Comments	17

1 Front

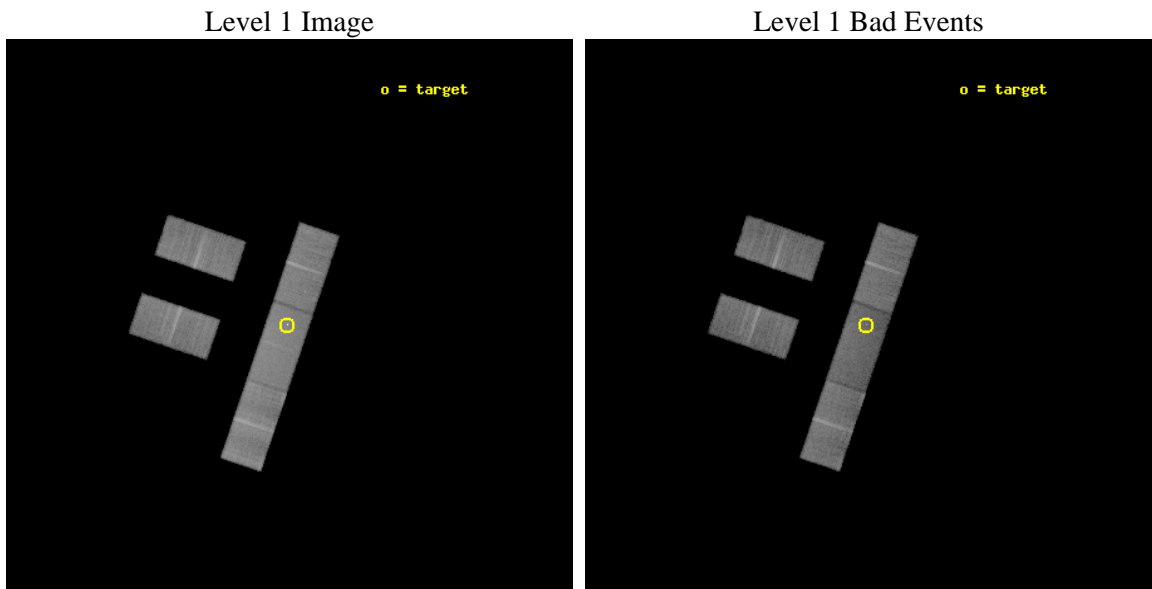
seq_num	702464	Sequence number
obs_id	12831	Observation id
title	Energy Dependent X-ray Microlensing	Proposal title
observer	Dr. Christopher Kochanek	Principal investigator
object	Q2237+0305	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	340.12625	Observer's specified target RA [deg]
dec_targ	3.358	Observer's specified target Dec [deg]
ra_nom	340.12250524035	Nominal RA [deg]
dec_nom	3.3611083224491	Nominal Dec [deg]
roll_nom	108.73211038322	Nominal Roll [deg]
revision	2	Processing version of data
ontime	30062.79978925	Sum of GTIs [s]
livetime	29354.15593078	Livetime [s]
ontime2	30059.317749023	Sum of GTIs [s]
ontime3	30061.058749199	Sum of GTIs [s]
ontime6	30062.79978925	Sum of GTIs [s]
ontime7	30062.79978925	Sum of GTIs [s]
ontime8	30062.79978925	Sum of GTIs [s]
l2events	104760	Number of level 2 events



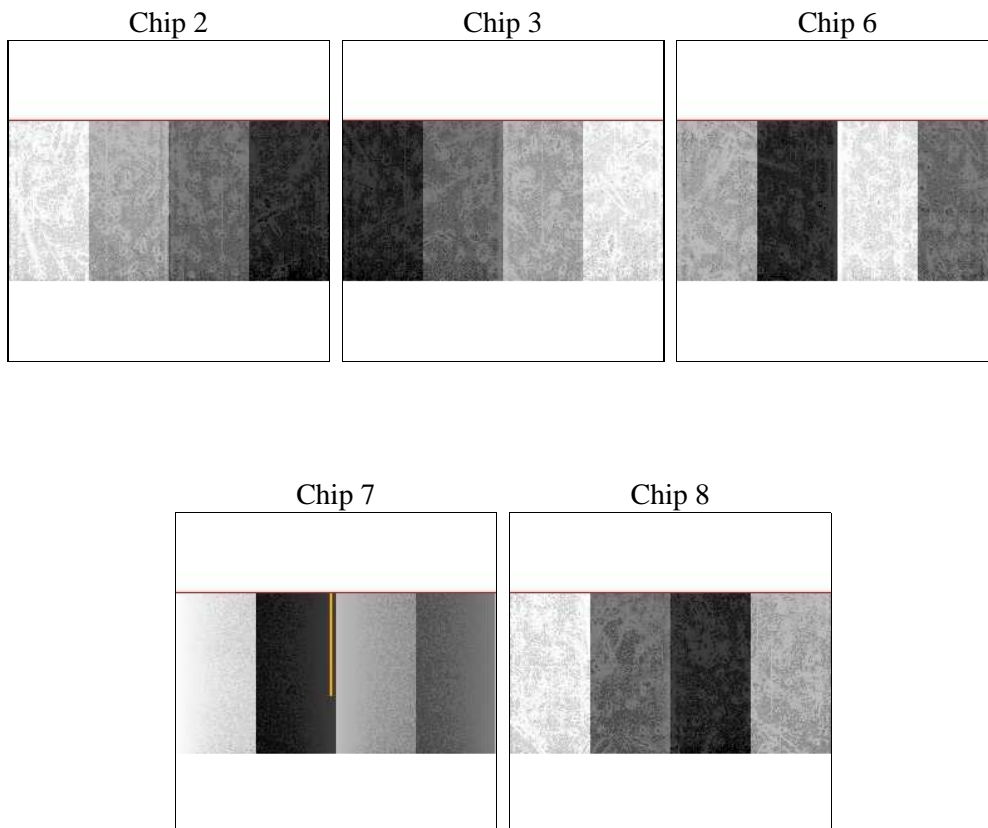
2 OBI

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	8.4.3	Processing system revision	ontime	30062.79978925	Sum of GTIs [s]
caldbver	4.4.7	 	ontime2	30059.317749023	Sum of GTIs [s]
date	2012-02-10T06:27:16	Date and time of file creation	ontime3	30061.058749199	Sum of GTIs [s]
revision	2	Processing version of data	ontime6	30062.79978925	Sum of GTIs [s]
			ontime7	30062.79978925	Sum of GTIs [s]
			ontime8	30062.79978925	Sum of GTIs [s]
			l1events	606824	Number of level 1 events

2.1.4 Events

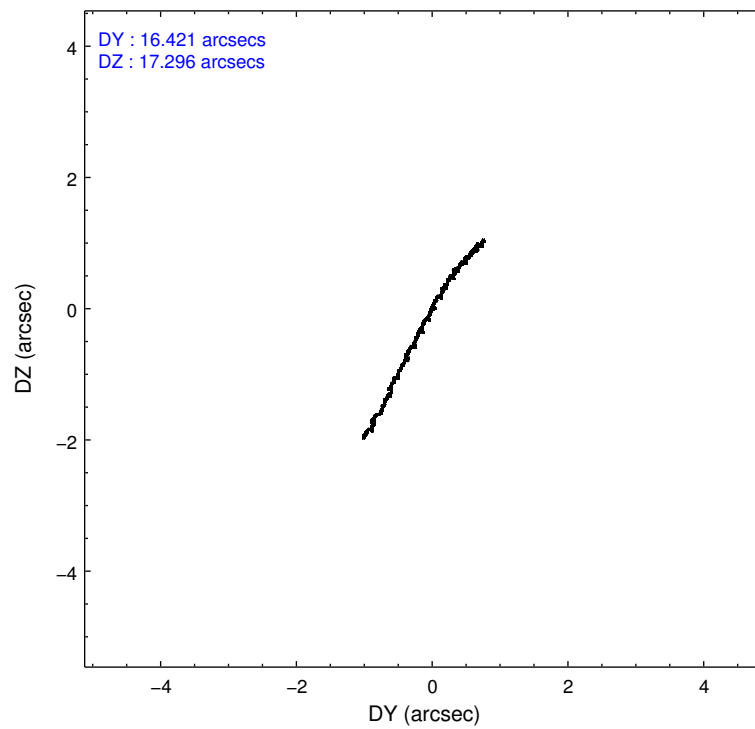
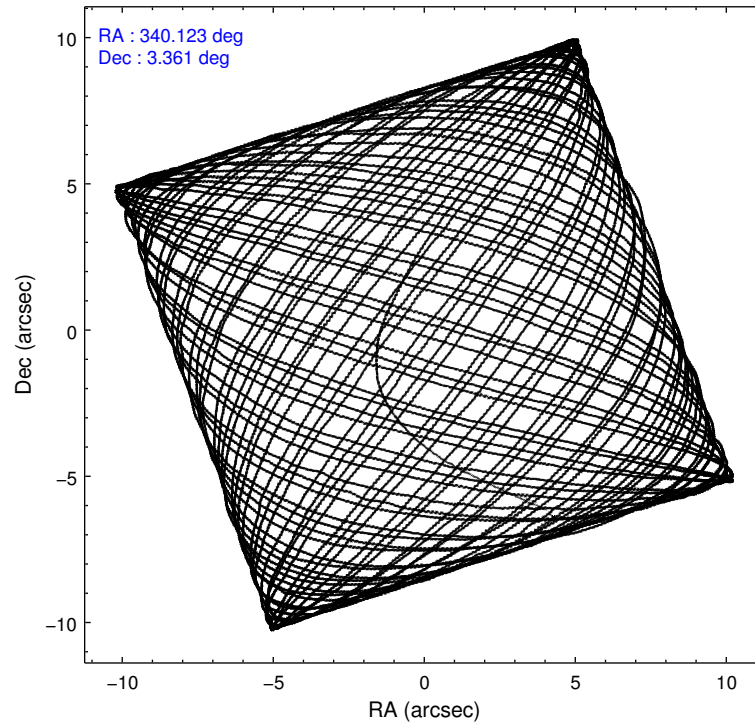
	ccd 2	ccd 3	ccd 6	ccd 7	ccd 8
level 1 events	106716	105774	113557	135360	145417
rejected events	94967	94588	100519	71369	107344
rejected %	88%	89%	88%	52%	73%

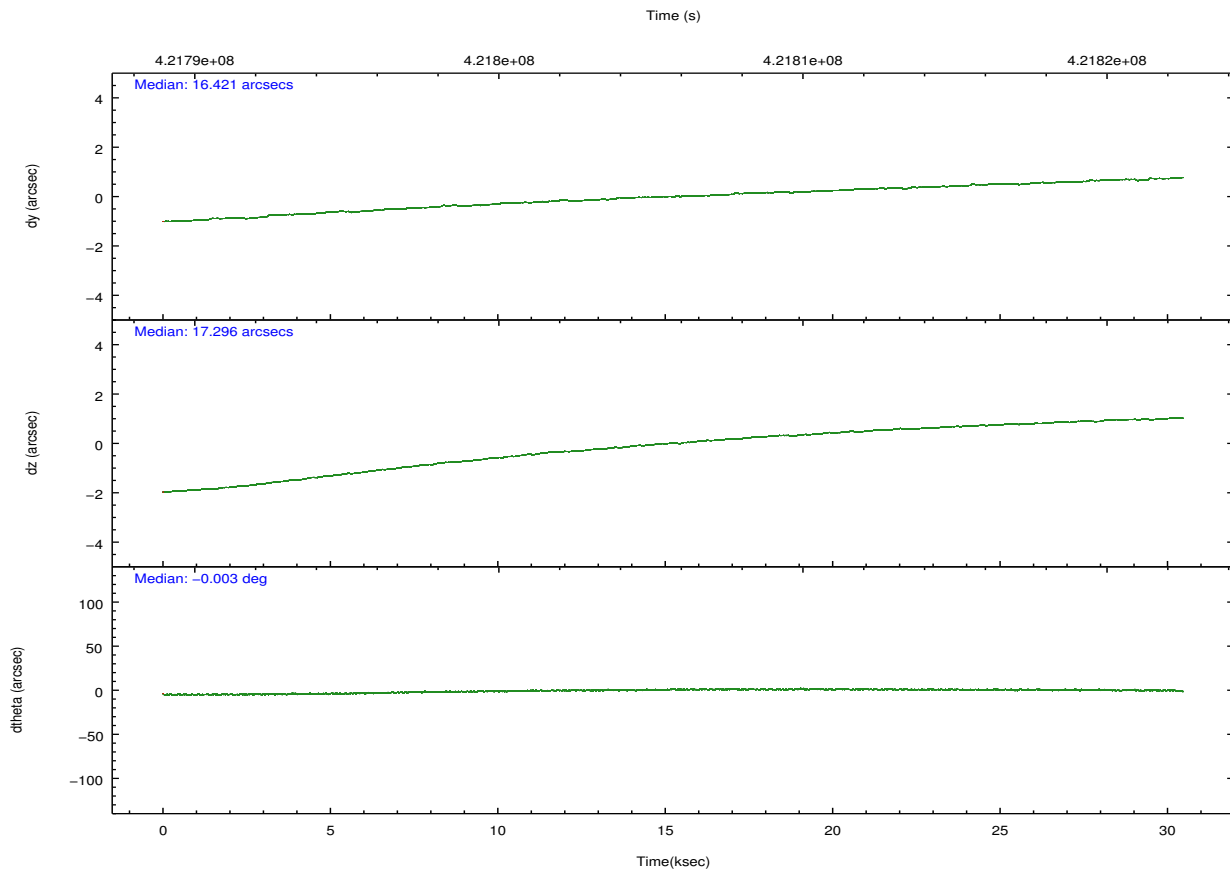
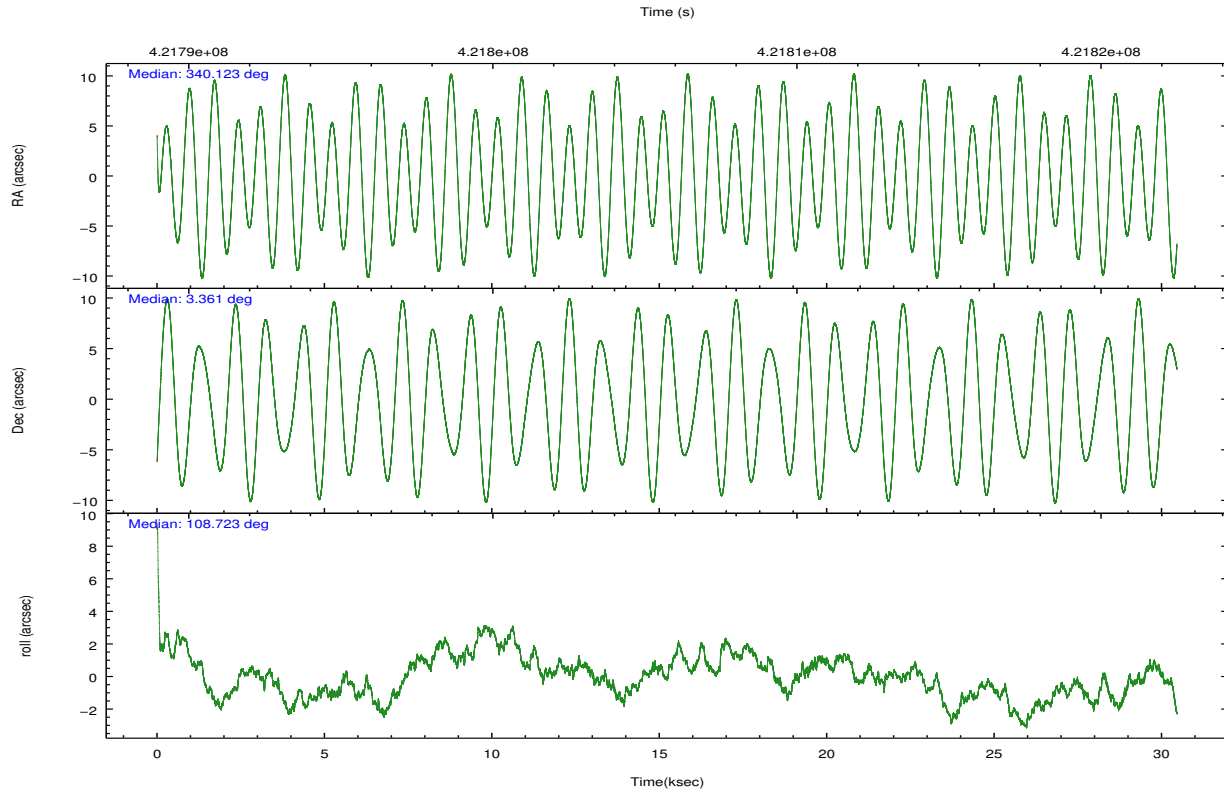
	ccd 2	ccd 3	ccd 6	ccd 7	ccd 8
grade 0 events	4185	3677	4347	7102	11496
	3%	3%	3%	5%	7%
grade 1 events	54	47	35	162	98
	0%	0%	0%	0%	0%
grade 2 events	2582	2308	2817	13724	8268
	2%	2%	2%	10%	5%
grade 3 events	1453	1491	1520	6036	4360
	1%	1%	1%	4%	2%
grade 4 events	1470	1428	1553	6131	4167
	1%	1%	1%	4%	2%
grade 5 events	3709	4894	4754	13677	6839
	3%	4%	4%	10%	4%
grade 6 events	2059	2282	2802	31000	9784
	1%	2%	2%	22%	6%
grade 7 events	91204	89647	95729	57528	100405
	85%	84%	84%	42%	69%

2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-23678	ACIS-23678	Obspar file type	PREDICTED	ACTUAL
Grating	NONE	NONE	Obspar update status	NONE	UPDATED
Data mode	VFAINT	VFAINT	CCD I0 on	N	N
Observation mode	POINTING	POINTING	CCD I1 on	N	N
[deg] Pointing RA	340.143342	340.1225052403452	CCD I2 on	O4	Y
[deg] Pointing Dec	3.343339	3.361108322449057	CCD I3 on	O3	Y
[deg] Pointing Roll	108.574255	108.7321103832228	CCD S0 on	N	N
[mm] SIM focus pos	-0.684267	-0.6828225247311905	CCD S1 on	N	N
[mm] SIM defocus	0	0.001444936568705701	CCD S2 on	O1	Y
[mm] SIM translation stage pos	-190.132523	-190.1400660498719	CCD S3 on	Y	Y
[mm] SIM translation stage offset	0	0.00754346686406393	CCD S4 on	O2	Y
[s] Observation start time (MET)	421790958.184000	421789388.709	CCD S5 on	N	N
Observation start date	2011-05-14T20:08:12	2011-05-14T19:43:08	Number of optional ACIS chips dropped	0	0
[s] Observation end time (MET)	421820958.184000	421821894.02319	On-chip summing requested	N	N
Observation end date	2011-05-15T04:28:12	2011-05-15T04:44:54	Subarray requested	CUSTOM	1/2
Read mode	TIMED	TIMED	Subarray start row	257	257
			Subarray row count	512	512
			Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	1.7

2.3 Aspect



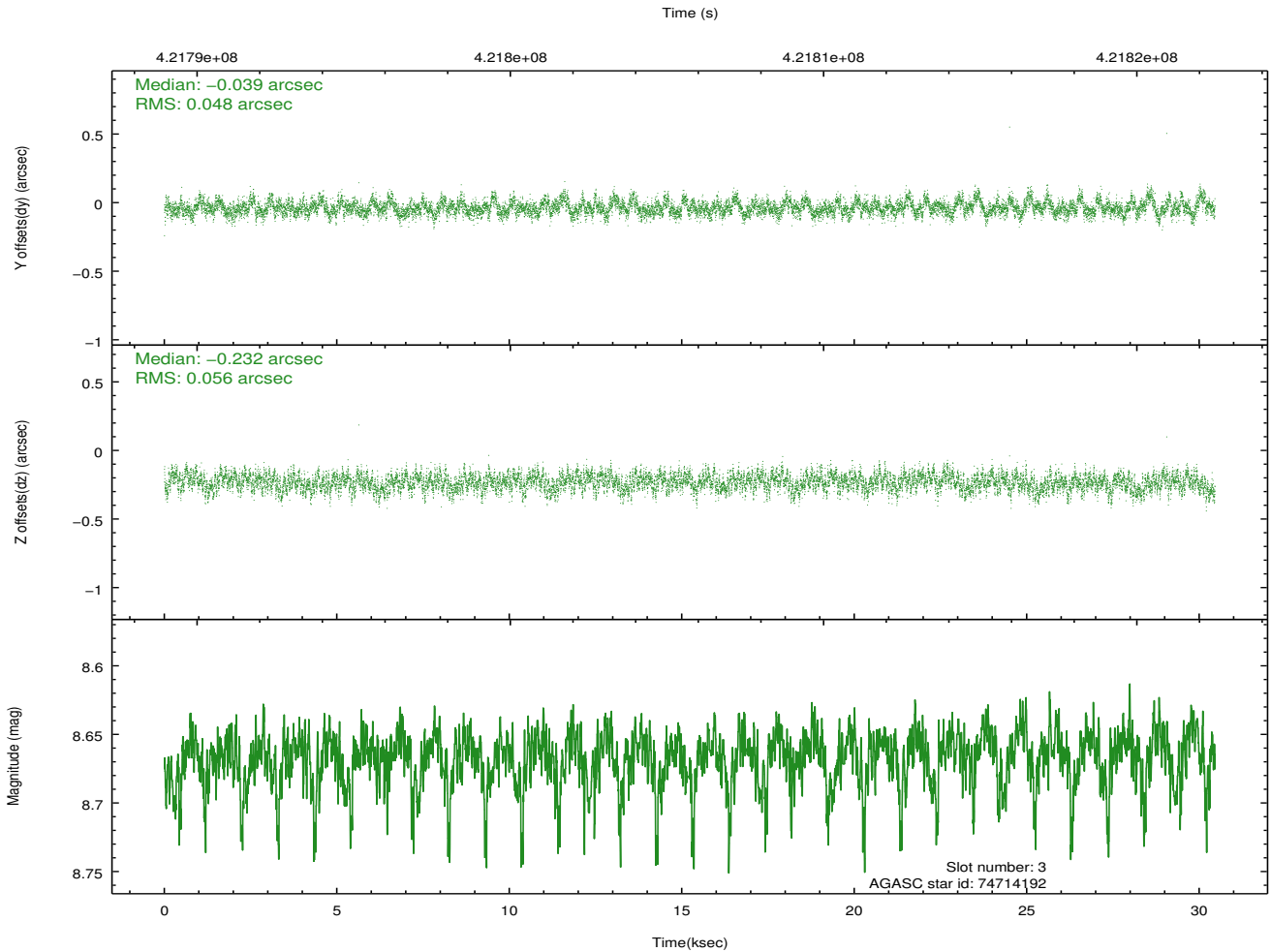
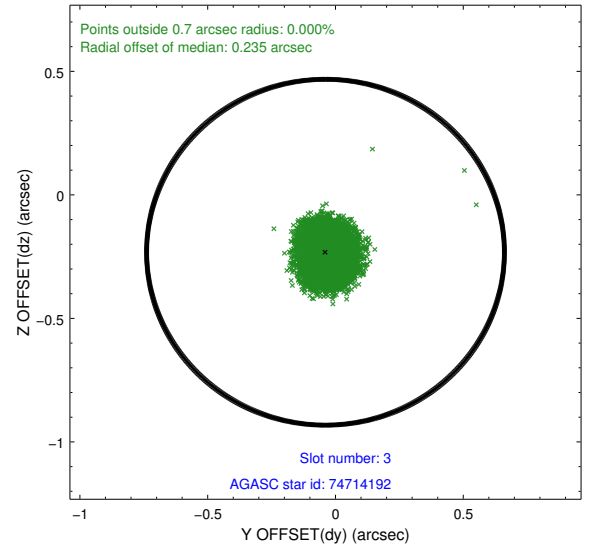
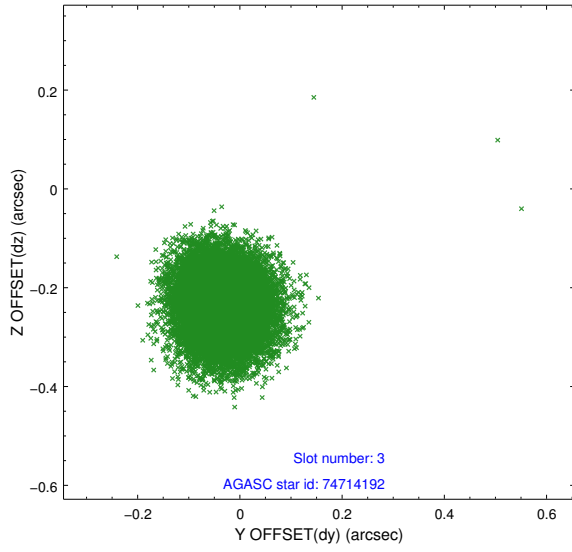


Slot Statistics

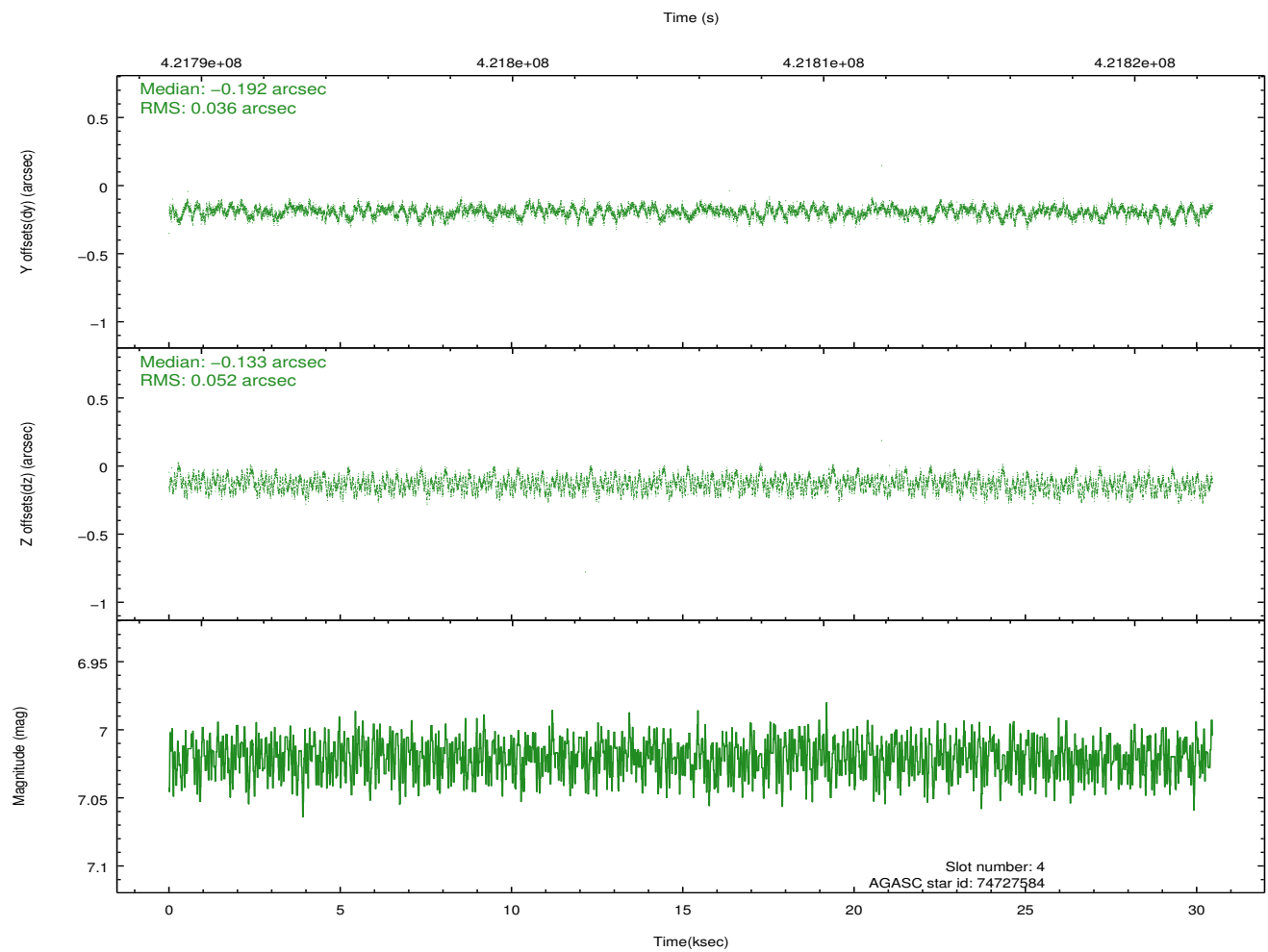
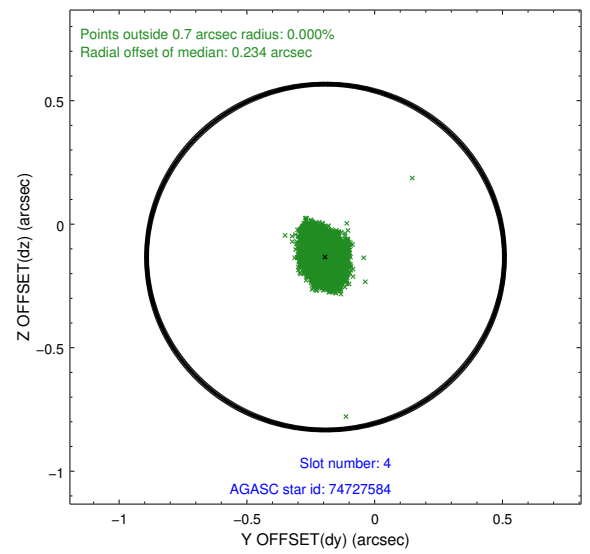
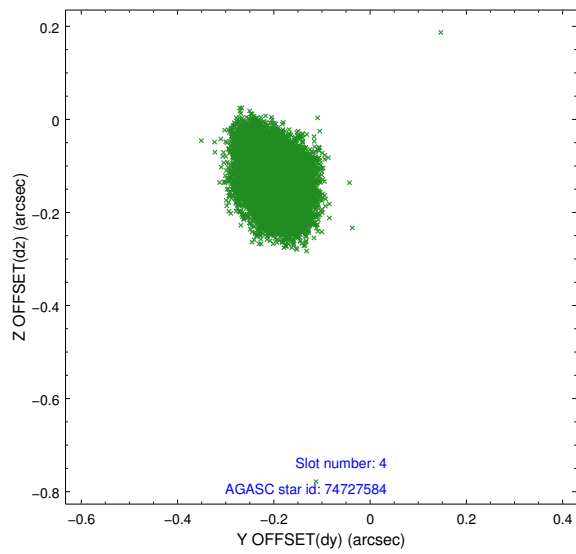
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	6.95	7427	-0.070	-0.038	0.023	0.042	0.000000	0.000000	-769.48	-1738.58
1	FID	ACIS-S-4	7.04	7428	0.167	0.045	0.009	0.031	0.000000	0.000000	2144.03	169.88
2	FID	ACIS-S-5	7.07	7429	-0.126	0.004	0.026	0.043	0.000000	0.000000	-1822.26	163.62
3	GUIDE	74714192	8.67	14817	-0.039	-0.232	0.079	0.126	339.623837	3.342441	591.98	1770.48
4	GUIDE	74727584	7.02	14853	-0.192	-0.133	0.068	0.110	339.633744	3.463732	994.36	1597.72
5	GUIDE	74842128	8.52	14844	0.360	0.060	0.089	0.136	340.118134	3.132788	-689.21	327.67
6	GUIDE	74854992	8.27	14840	0.016	0.326	0.074	0.113	340.342808	3.603730	660.47	-977.24
7	GUIDE	74855640	8.84	14850	-0.130	-0.018	0.089	0.146	340.341123	3.746937	1151.27	-1136.28

2.4 Star Slots

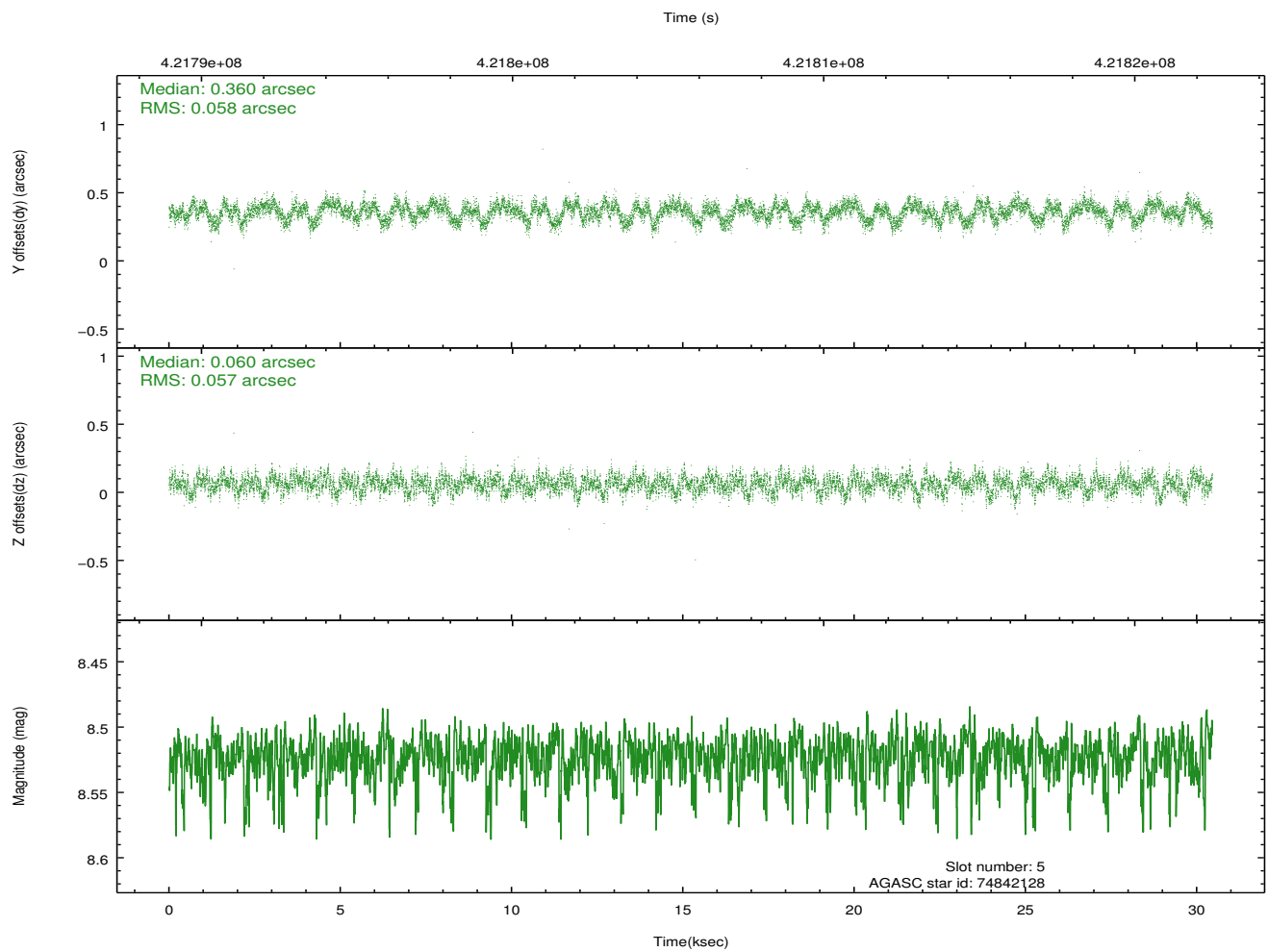
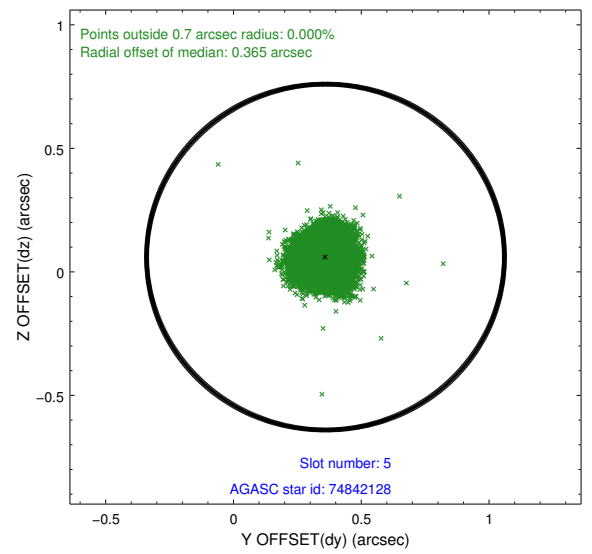
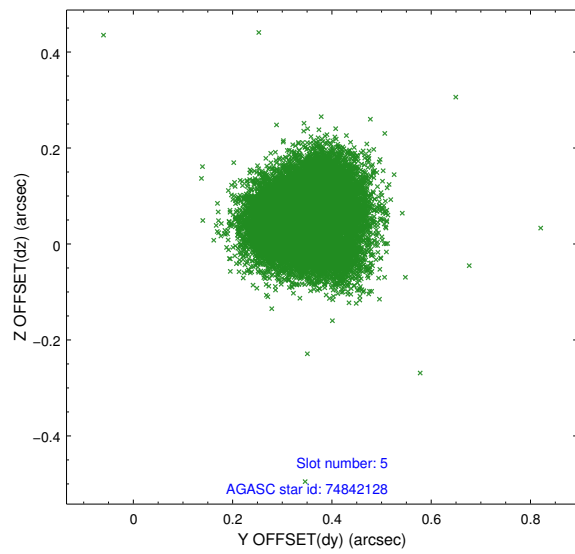
2.4.1 Slot 3



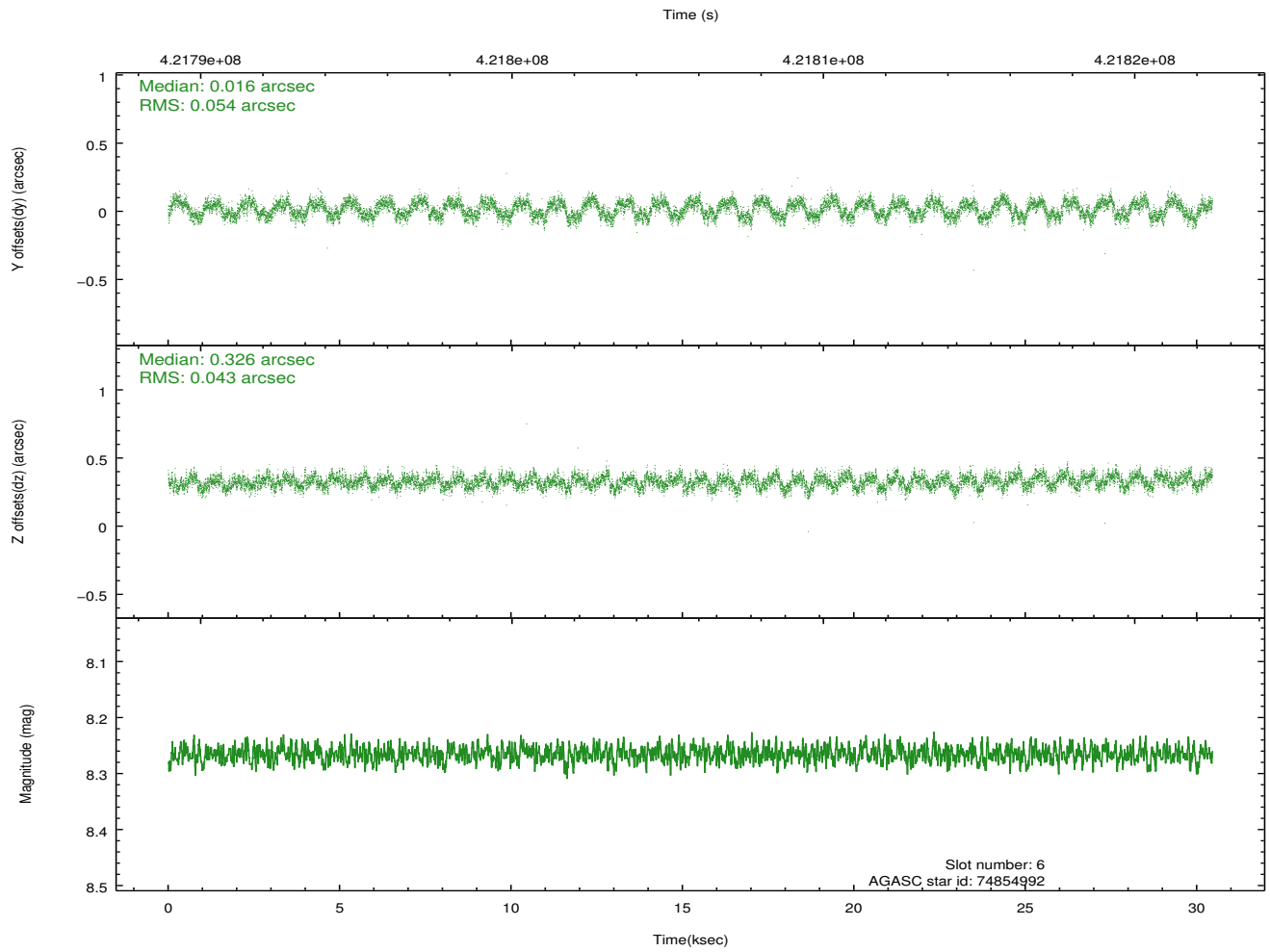
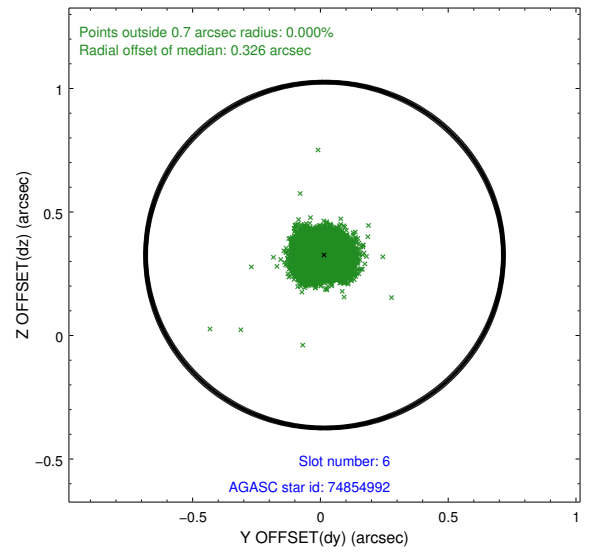
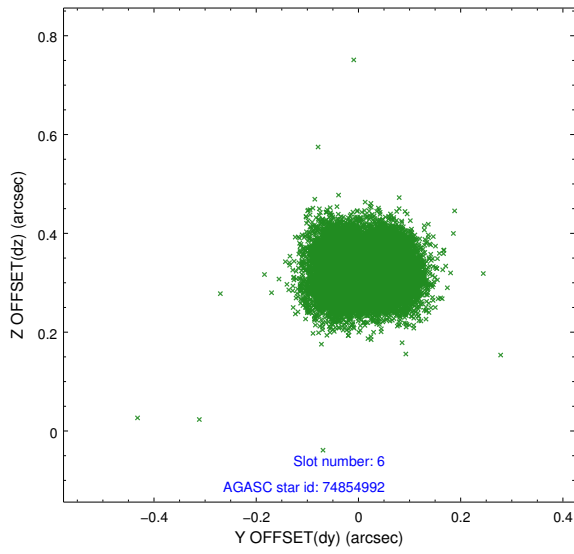
2.4.2 Slot 4



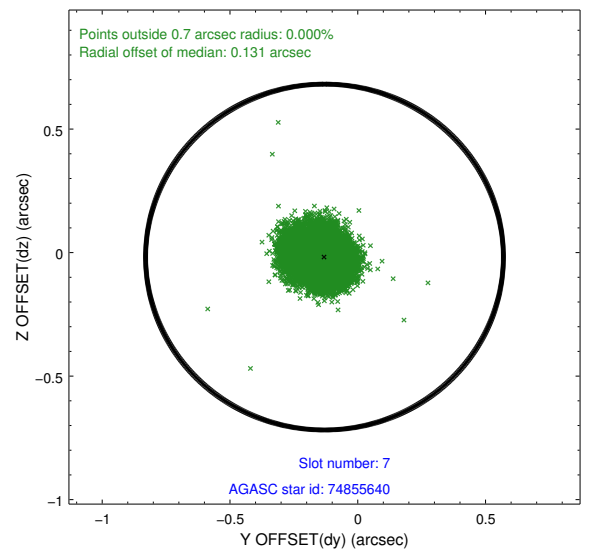
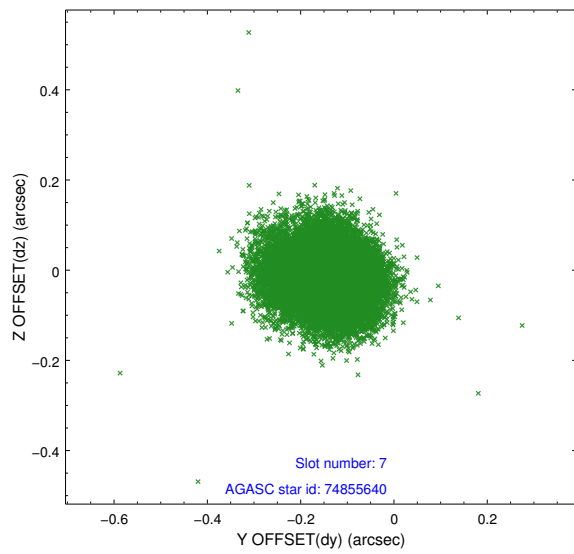
2.4.3 Slot 5



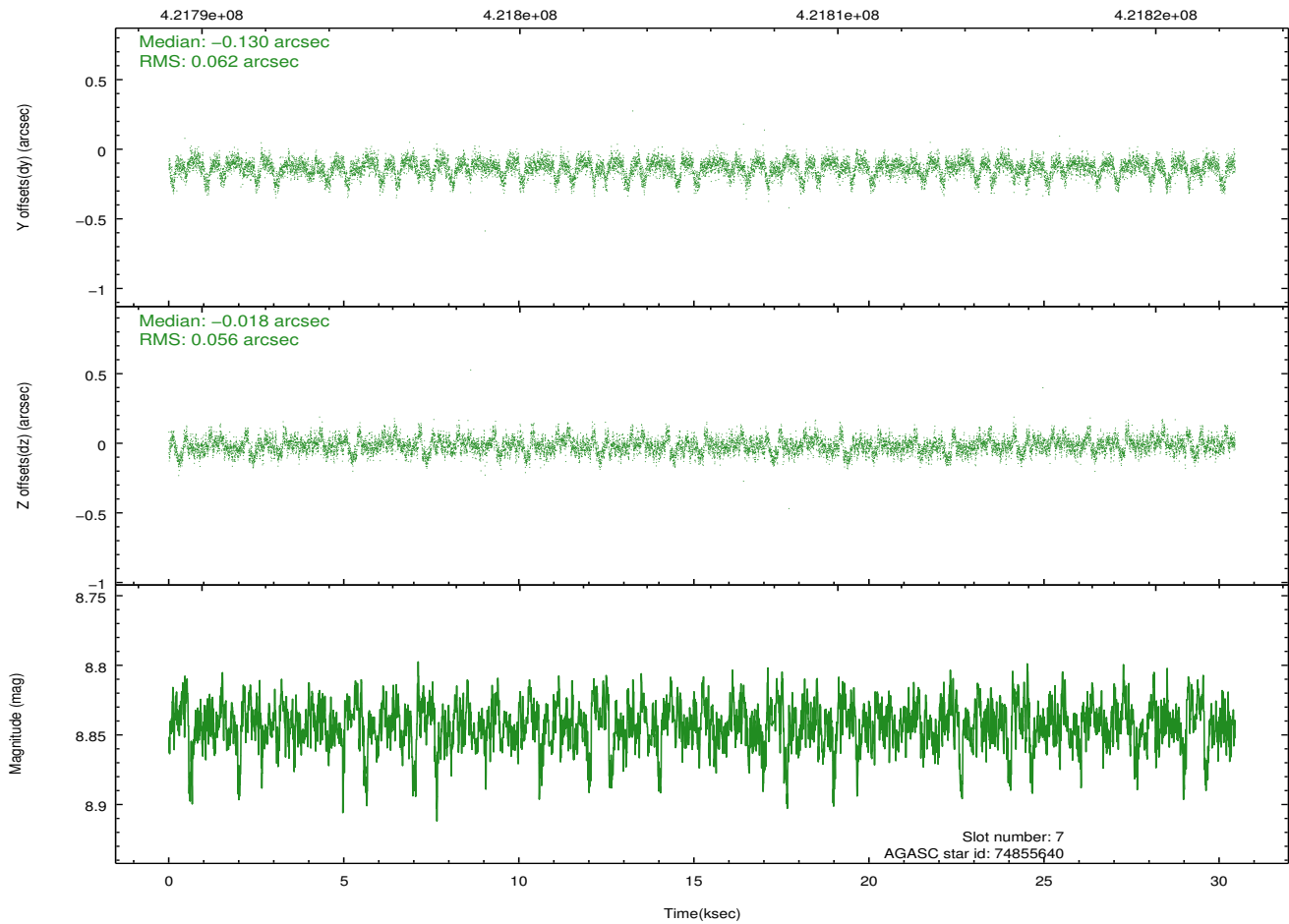
2.4.4 Slot 6



2.4.5 Slot 7

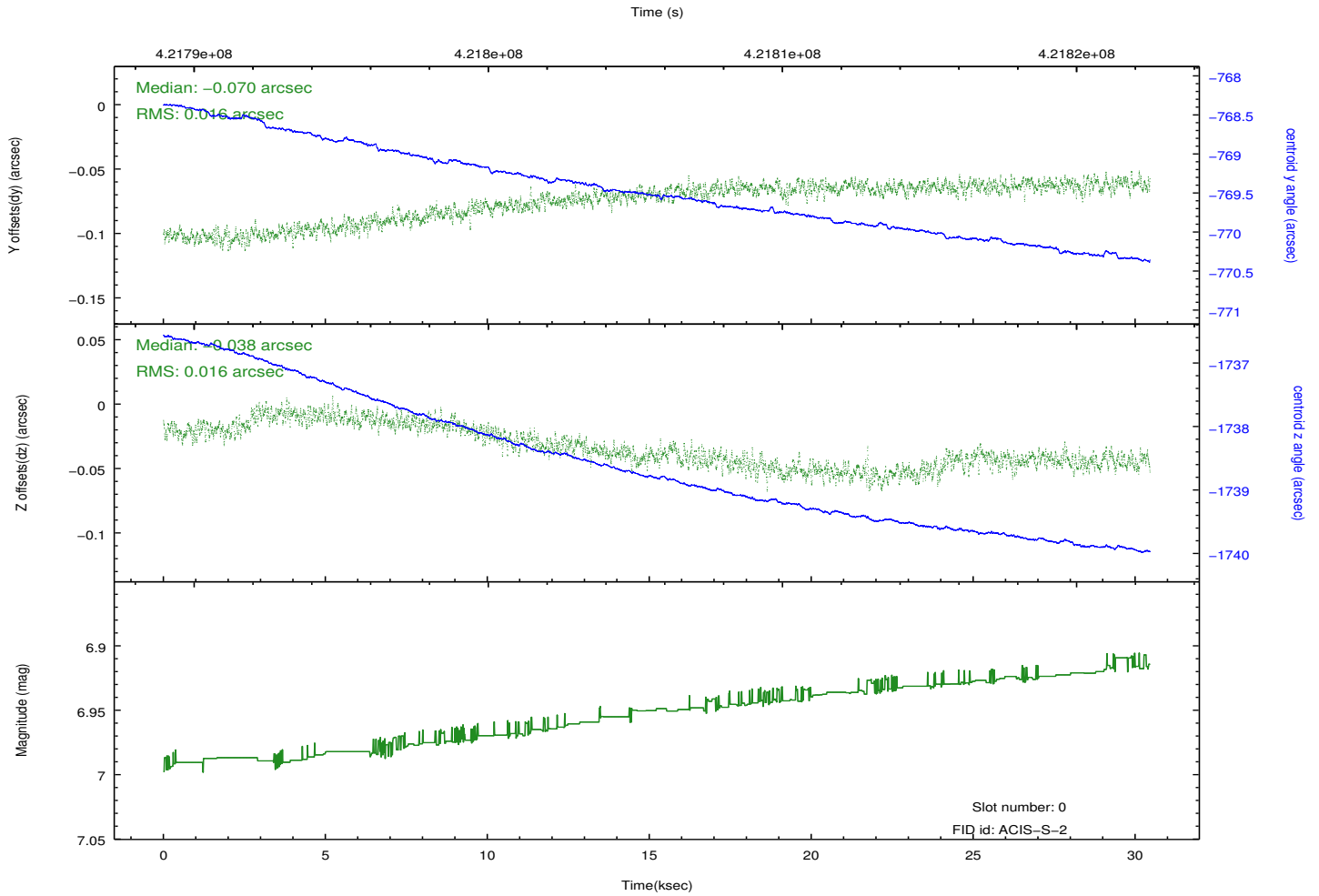
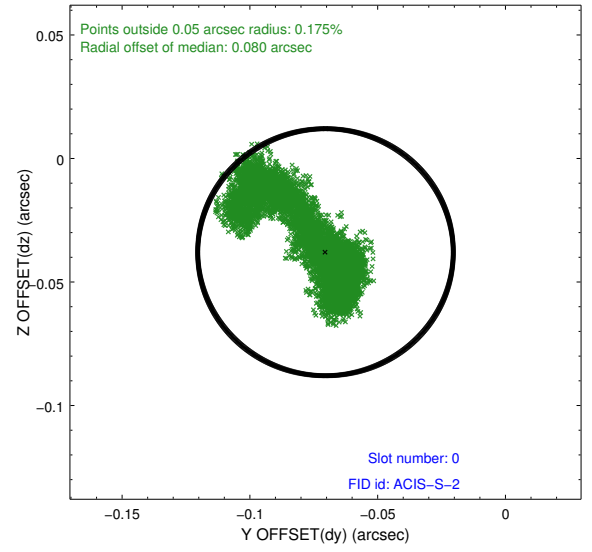
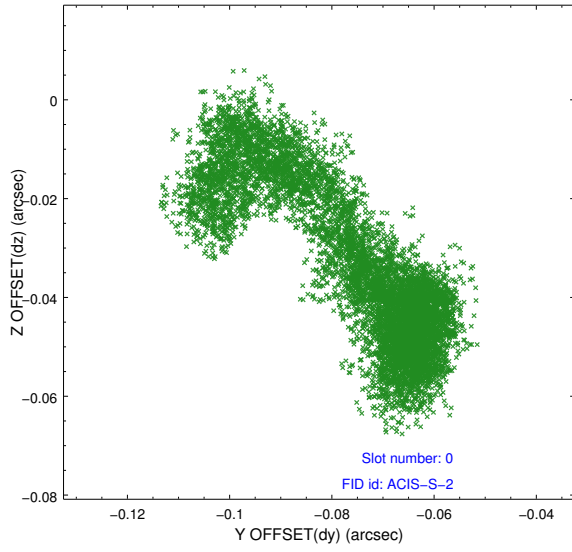


Time (s)

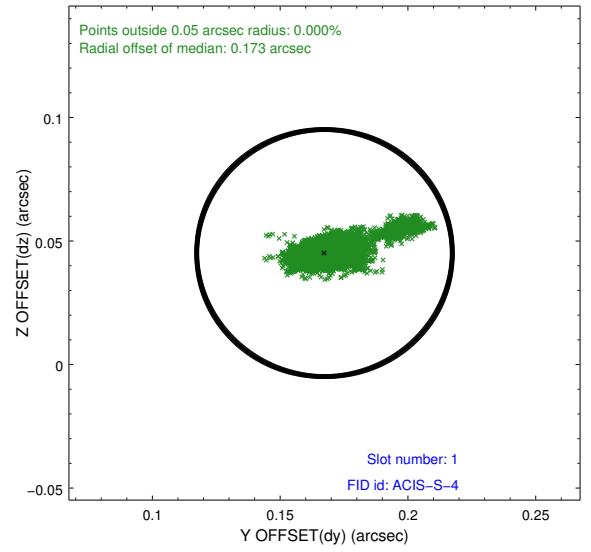
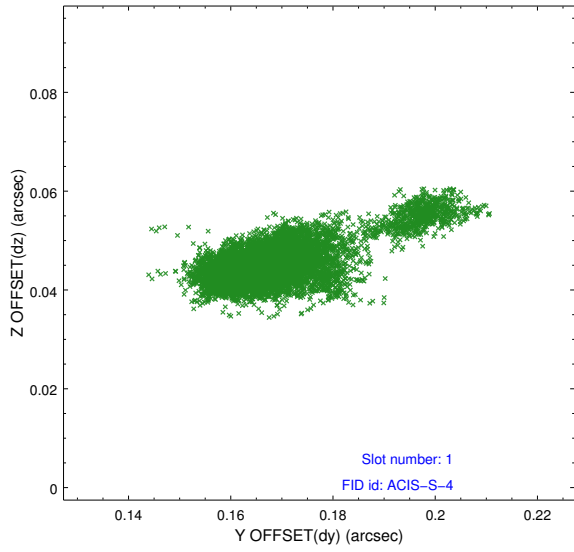


2.5 FID Slots

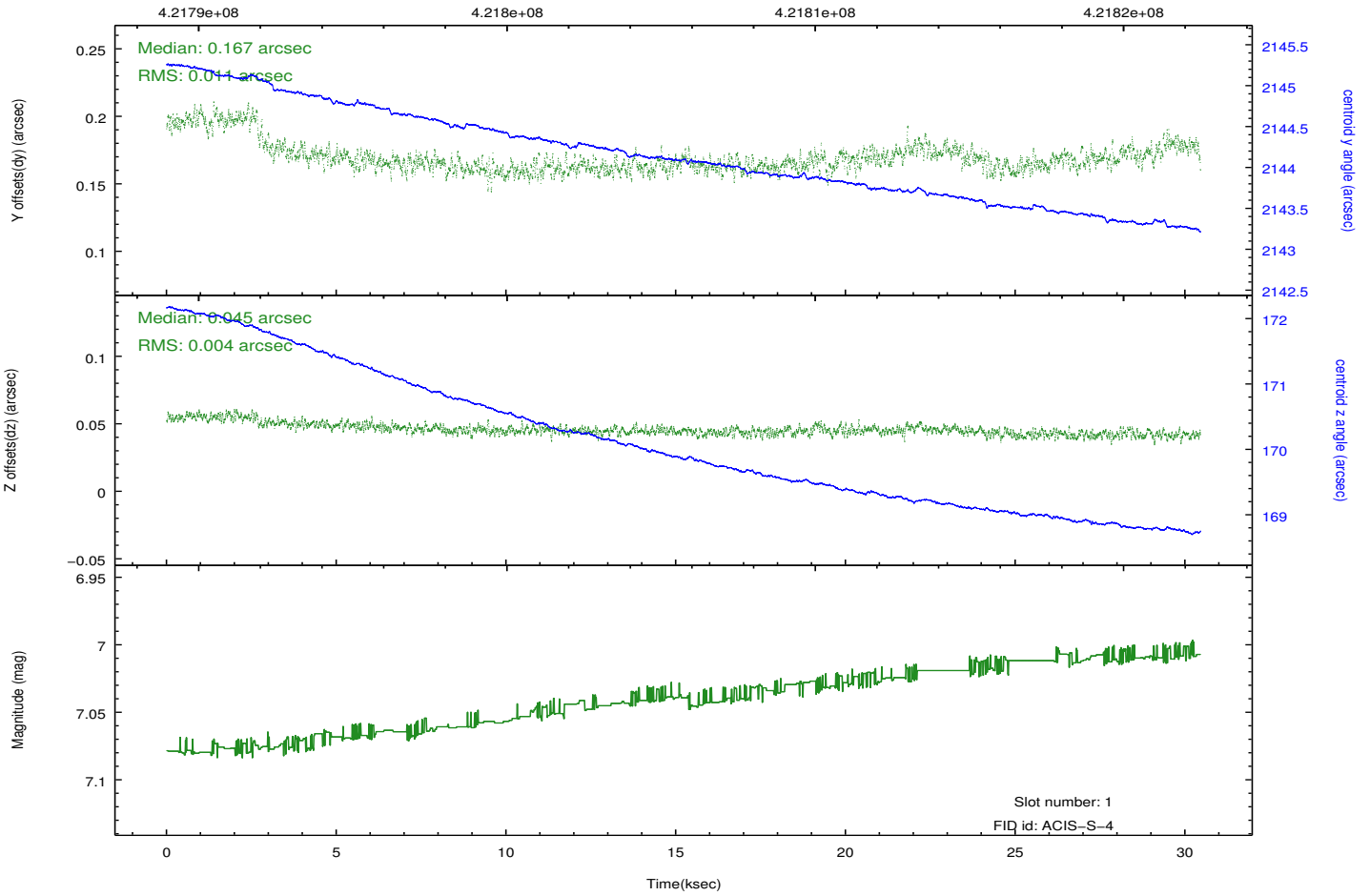
2.5.1 Slot 0



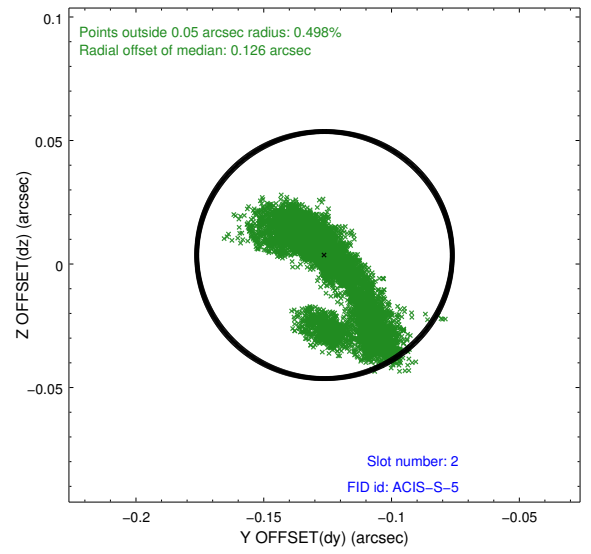
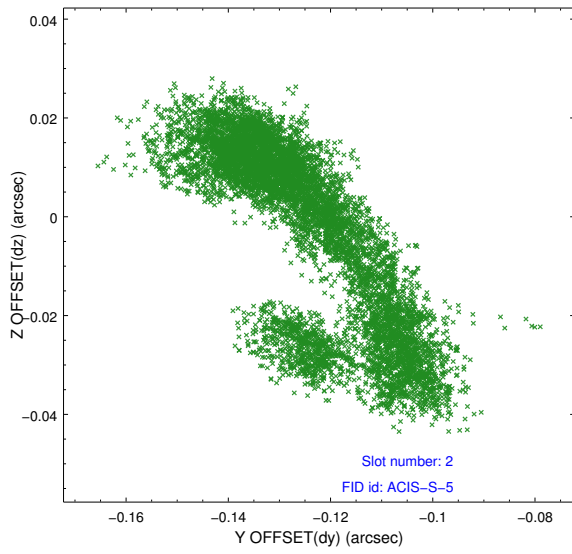
2.5.2 Slot 1



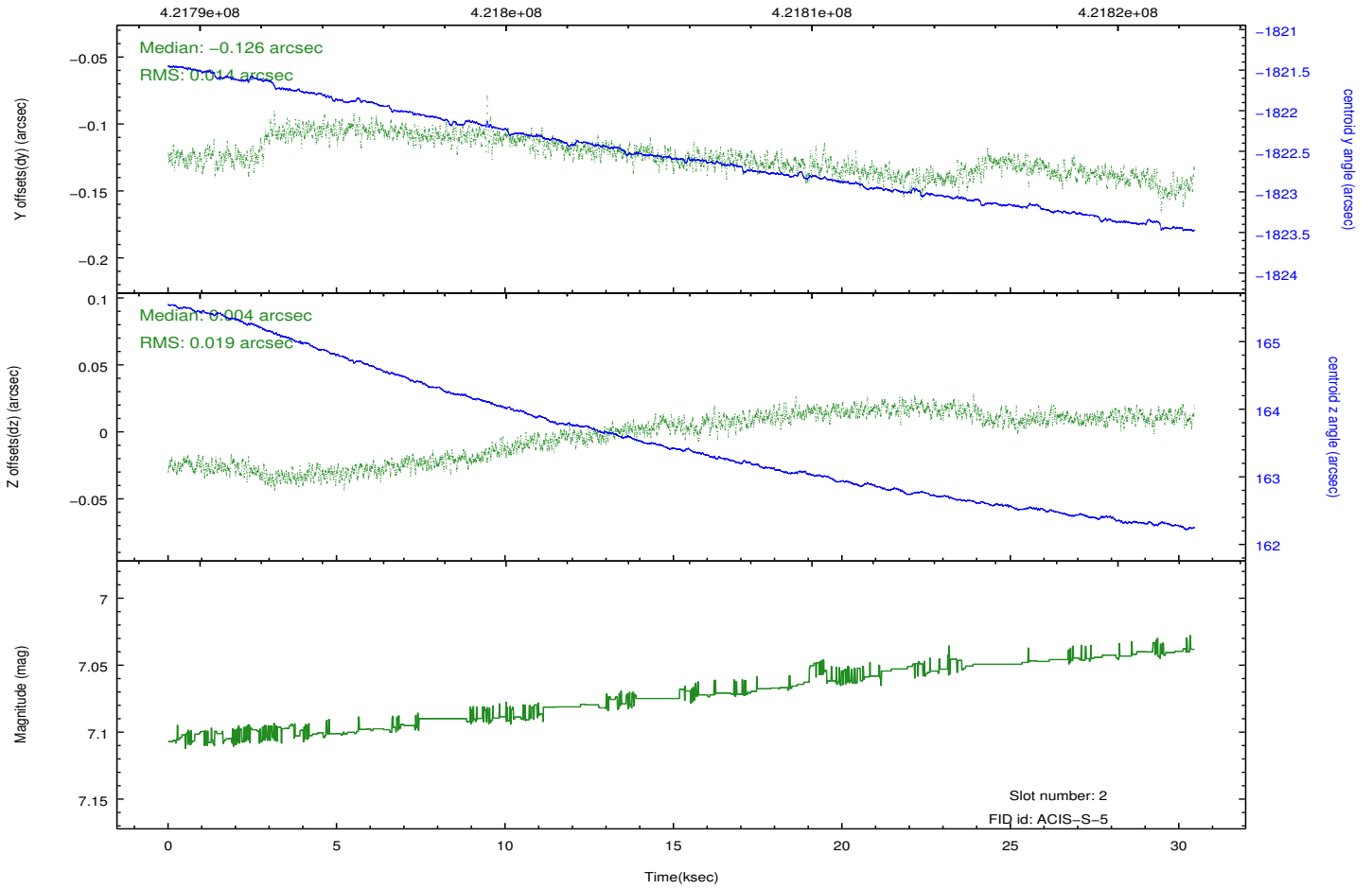
Time (s)



2.5.3 Slot 2



Time (s)



A Summary

A.1 Status

V&V Scientist	Beth Sundheim
V&V Date (YYYY-MM-DD)	2018.03.06
V&V Edition	2
V&V Disposition and Status	OK
V&V Charge Time	30.06279978925

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/A_CIS_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.

=

The data for this observation have been processed using the 'EDSER' sub-pixel event-repositioning algorithm of Li et al. (2004, ApJ, 610, 1204). Small-scale features should become sharper for sources near the aim point. The improvement will be less noticeable for off-axis sources where the size of the point-spread function is comparable to or larger than the size of an ACIS pixel. To take full advantage of the

improvement, images should be binned on spatial scales smaller than the size of an ACIS pixel. Note that, at present, the point-spread function has not been calibrated for data to which the EDSEER algorithm has been applied. If dither was disabled for the observation, then the algorithm can introduce artificial aliasing effects on spatial scales smaller than a pixel. If you would prefer to use no sub-pixel adjustment or to apply a coordinate randomization, then use `acis_process_events` to reprocess the data with the parameter `pix_adj=NONE` or `RANDOMIZE`, respectively.