V&V Reference Report
L2 ASCDS Version : 10.4.3.1

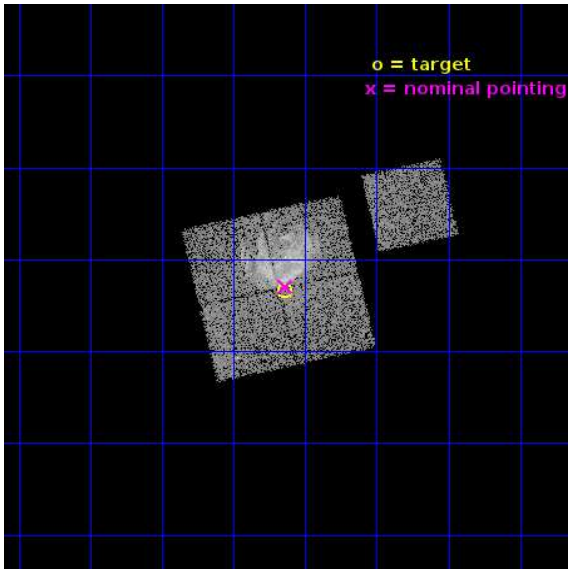
Observation 17659 - L2 Version 1
Chandra X-Ray Center

L2 Processing Date : Feb 23 2016

Contents

1 Front

seq_num	502480	Sequence number
obs_id	17659	Observation id
title	Studying the transient magnetar 3XMMJ185246.6+003317 close to SNR Kes 79	Proposal title
observer	Dr. Stephen Murray	Principal investigator
object	Kes 79	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	283.160417	Observer's specified target RA [deg]
dec_targ	0.610083	Observer's specified target Dec [deg]
ra_nom	283.15940065985	Nominal RA [deg]
dec_nom	0.6172853681355	Nominal Dec [deg]
roll_nom	77.191776659534	Nominal Roll [deg]
revision	1	Processing version of data
ontime	10056.400077462	Sum of GTIs [s]
livetime	9925.0058070361	Livetime [s]
ontime0	10046.977026463	Sum of GTIs [s]
ontime1	10056.400077462	Sum of GTIs [s]
ontime2	10056.400077462	Sum of GTIs [s]
ontime3	10056.400077462	Sum of GTIs [s]
ontime6	10053.259067059	Sum of GTIs [s]
l2events	45145	Number of level 2 events

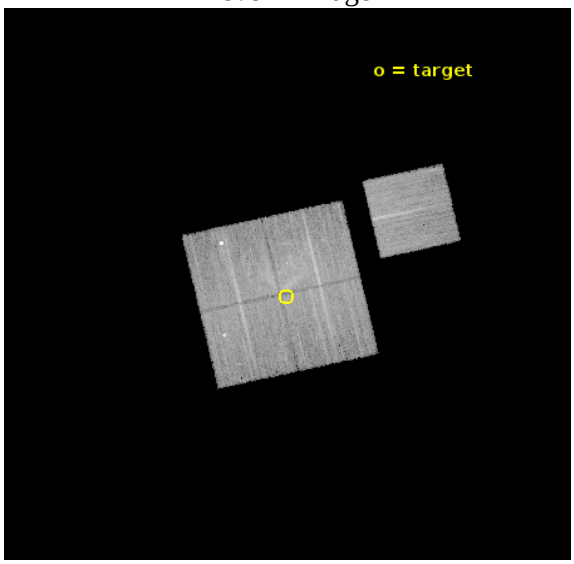


2 OBI

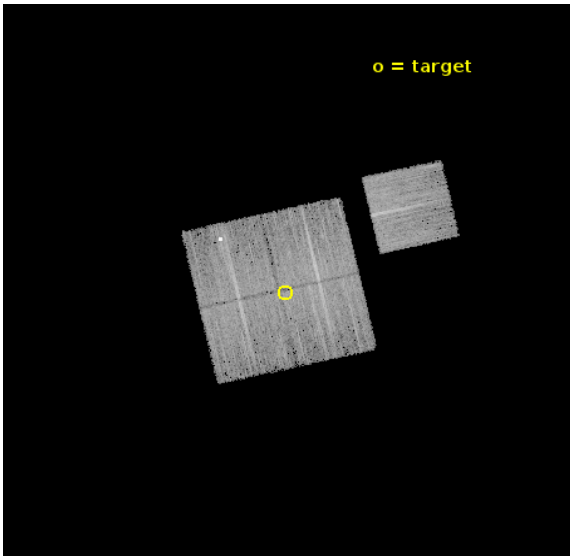
2.1 OBI

2.1.1 Images

Level 1 Image

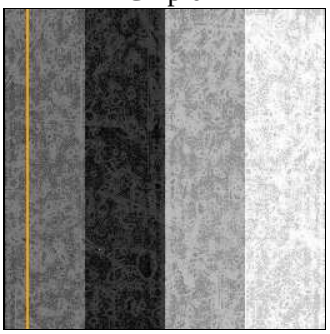


Level 1 Bad Events

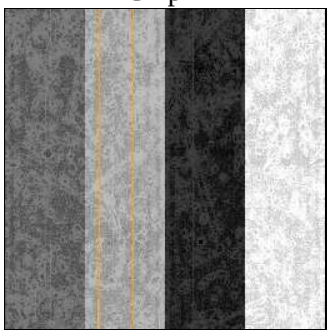


2.1.2 Bias

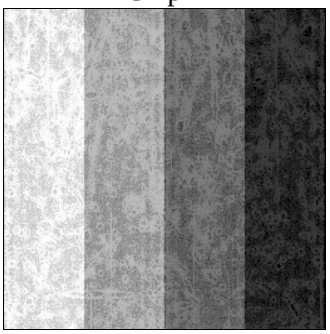
Chip 0



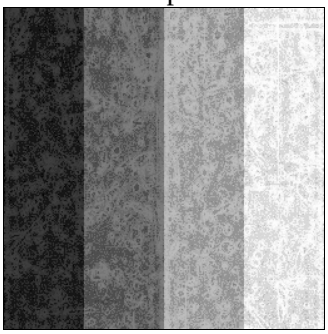
Chip 1



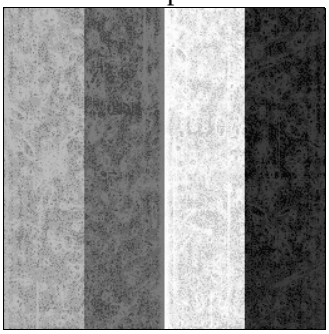
Chip 2



Chip 3



Chip 6



2.1.3 Parameters

obi_num	0	Obi number
ascdsver	10.4.3.1	Processing system revision
caldbver	4.7.0	
date	2016-02-23T23:00:36	Date and time of file creation
revision	1	Processing version of data

sched_exp_time	10000.000000	[s] Scheduled observation exposure time
ontime	10056.400077462	Sum of GTIs [s]
ontime0	10046.977026463	Sum of GTIs [s]
ontime1	10056.400077462	Sum of GTIs [s]
ontime2	10056.400077462	Sum of GTIs [s]
ontime3	10056.400077462	Sum of GTIs [s]
ontime6	10053.259067059	Sum of GTIs [s]
l1events	338604	Number of level 1 events

2.1.4 Events

	ccd 0	**ccd 1**	**ccd 2**	**ccd 3**	**ccd 6**
level 1 events	69122	62871	75328	63799	67484
rejected events	56752	53573	58958	56519	60308
rejected %	82%	85%	78%	88%	89%

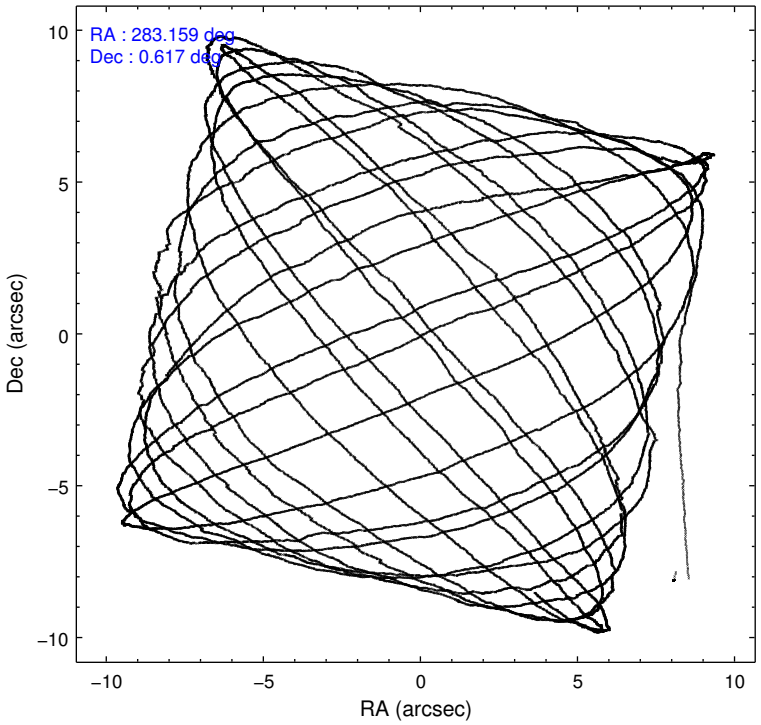
	ccd 0	**ccd 1**	**ccd 2**	**ccd 3**	**ccd 6**
grade 0 events	6791	3834	10473	2958	2169
	9%	6%	13%	4%	3%
grade 1 events	55	35	81	33	33
	0%	0%	0%	0%	0%
grade 2 events	2263	2171	2468	1429	1767
	3%	3%	3%	2%	2%
grade 3 events	859	718	958	707	683
	1%	1%	1%	1%	1%
grade 4 events	782	706	897	722	697
	1%	1%	1%	1%	1%
grade 5 events	2687	2672	2568	3036	2755
	3%	4%	3%	4%	4%
grade 6 events	1679	1872	1577	1465	1863
	2%	2%	2%	2%	2%
grade 7 events	54006	50863	56306	53449	57517
	78%	80%	74%	83%	85%

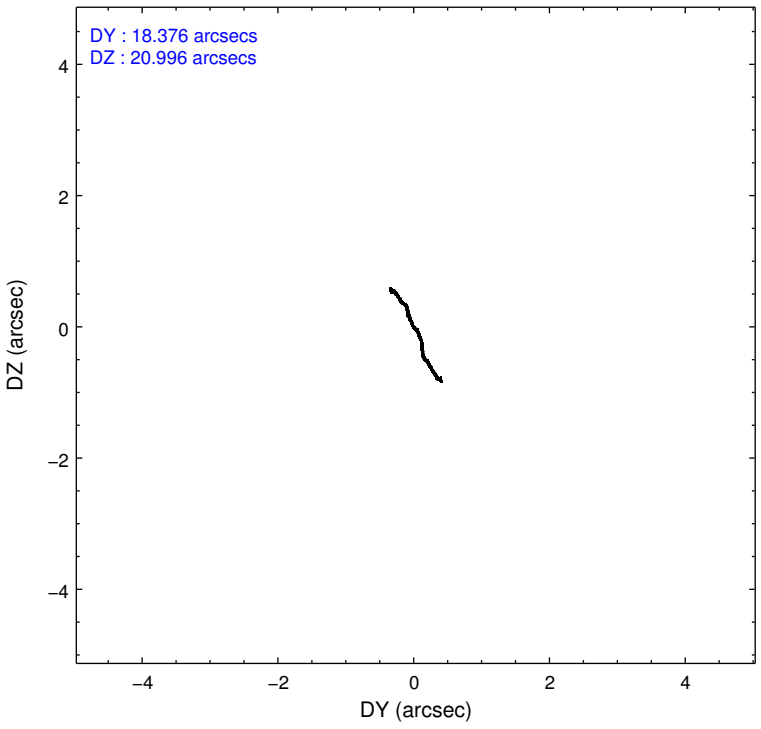
2.2 Compared Parameters

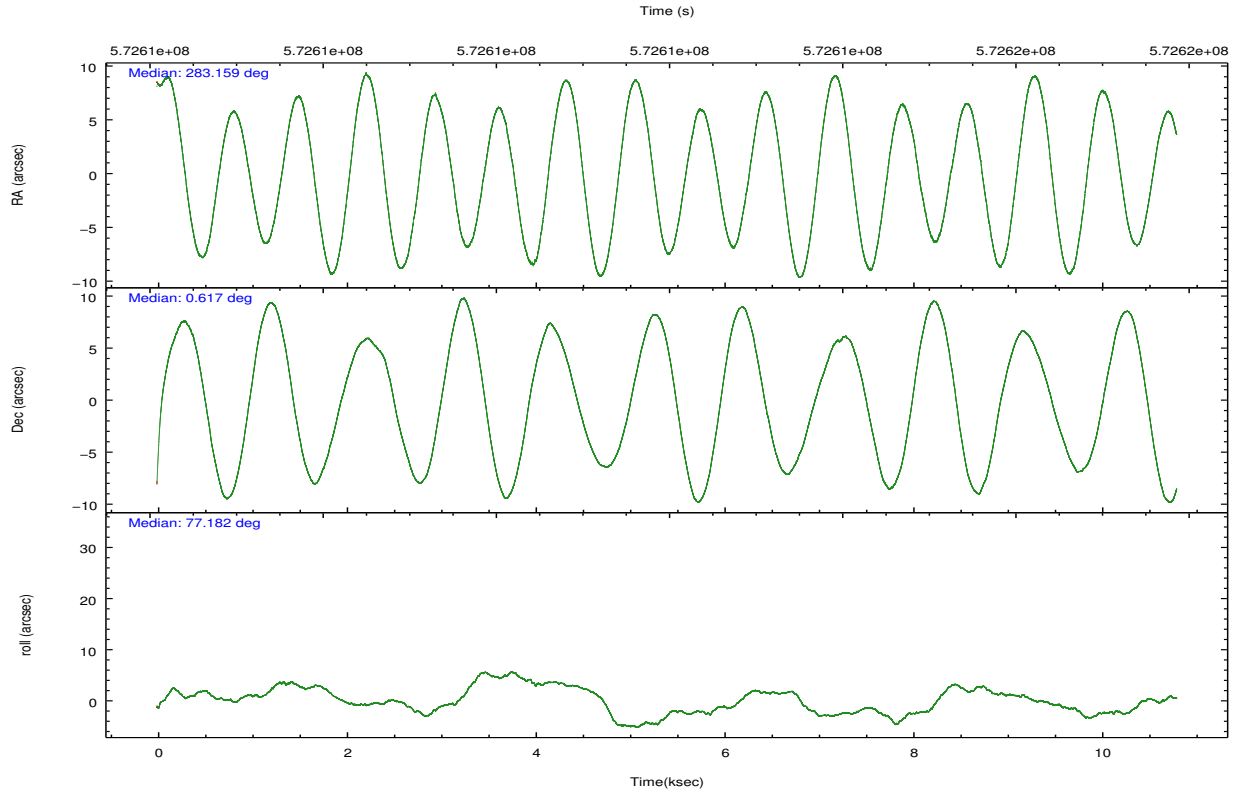
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-01236	ACIS-01236
Grating	NONE	NONE
Data mode	VFAINT	VFAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	283.167609	283.1594006598459
[deg] Pointing Dec	0.590945	0.6172853681355031
[deg] Pointing Roll	76.983015	77.1917766595336
[mm] SIM 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)	572607375.184000	572605504.78934
Observation start date	2016-02-23T09:35:07	2016-02-23T09:05:04
[s] Observation end time (MET)	572617375.184000	572618354.70257
Observation end date	2016-02-23T12:21:47	2016-02-23T12:39:14
Read mode	TIMED	TIMED

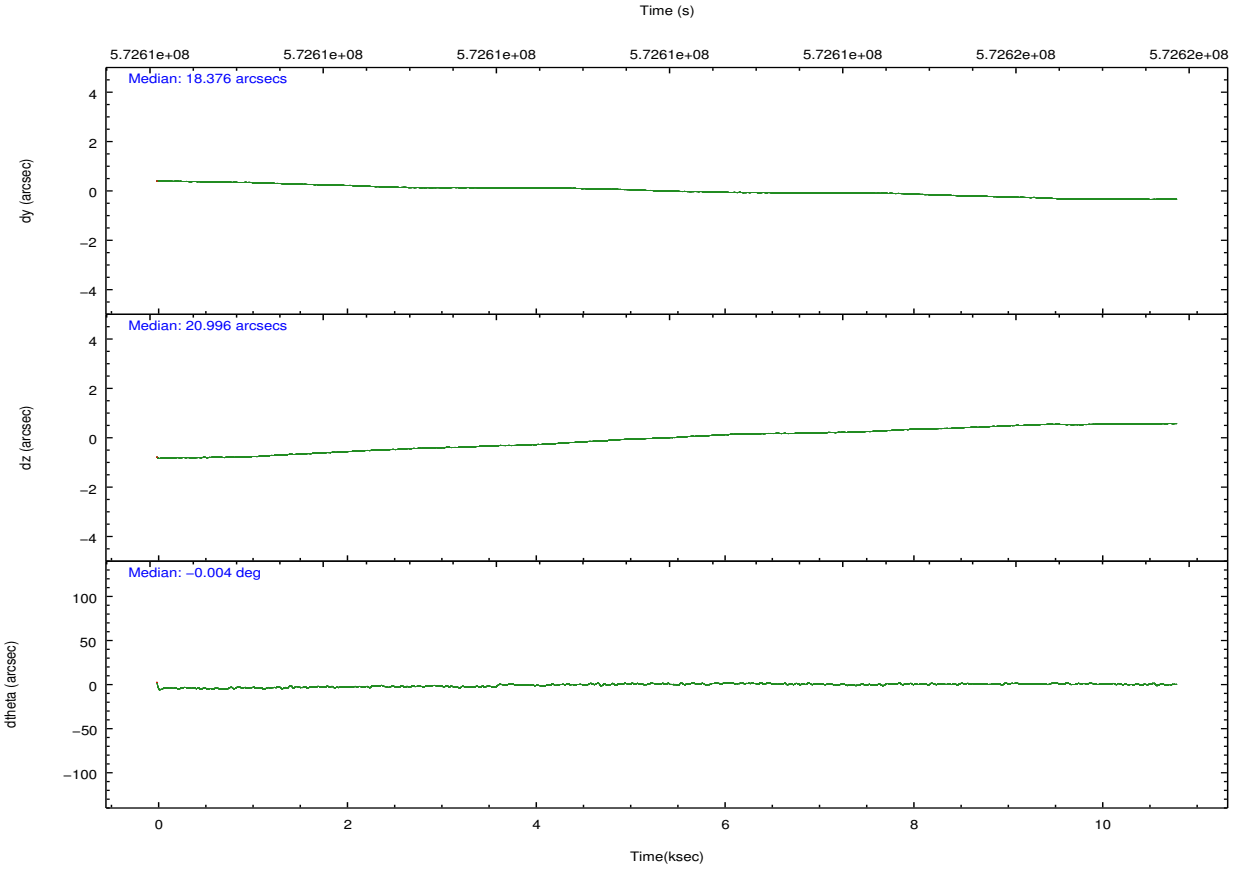
Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
CCD I0 on	Y	Y
CCD I1 on	Y	Y
CCD I2 on	Y	Y
CCD I3 on	Y	Y
CCD S0 on	N	N
CCD S1 on	N	N
CCD S2 on	O1	Y
CCD S3 on	N	N
CCD S4 on	N	N
CCD S5 on	N	N
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	NONE	NONE
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	3.1

2.3 Aspect


RA : 283.159 deg
Dec : 0.617 deg
Dec (arcsec)
RA (arcsec)
10
5
0
−5
−10
−10
−5
0
5
10


DY : 18.376 arcsecs
DZ : 20.996 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−4
−2
0
2
4


Time (s)
5.7261e+08
5.7261e+08
5.7261e+08
5.7261e+08
5.7261e+08
5.7262e+08
5.7262e+08
Median: 283.159 deg
RA (arcsec)
Median: 0.617 deg
Dec (arcsec)
Median: 77.182 deg
roll (arcsec)
Time(ksec)

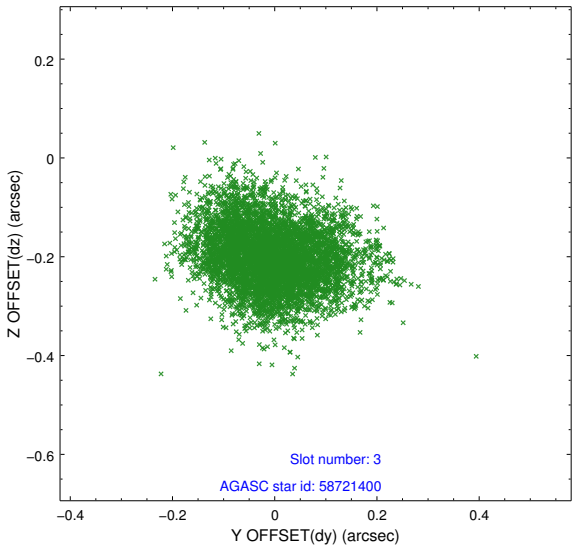

Time (s)
5.7261e+08
5.7261e+08
5.7261e+08
5.7261e+08
5.7261e+08
5.7262e+08
5.7262e+08
Median: 18.376 arcsecs
dy (arcsec)
Median: 20.996 arcsecs
dz (arcsec)
Median: −0.004 deg
dtheta (arcsec)
Time(ksec)

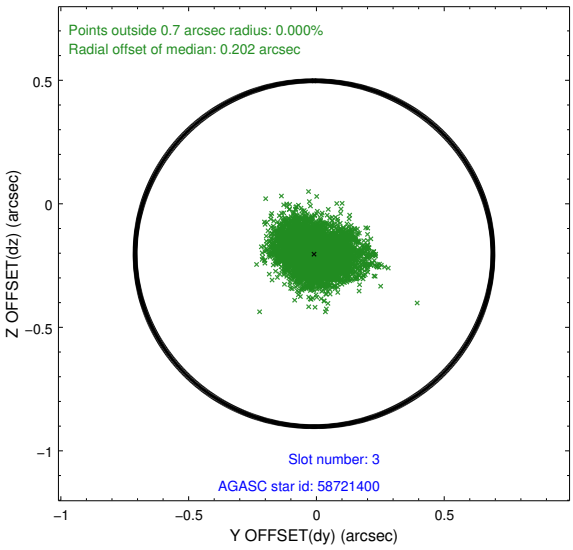
Slot Statistics

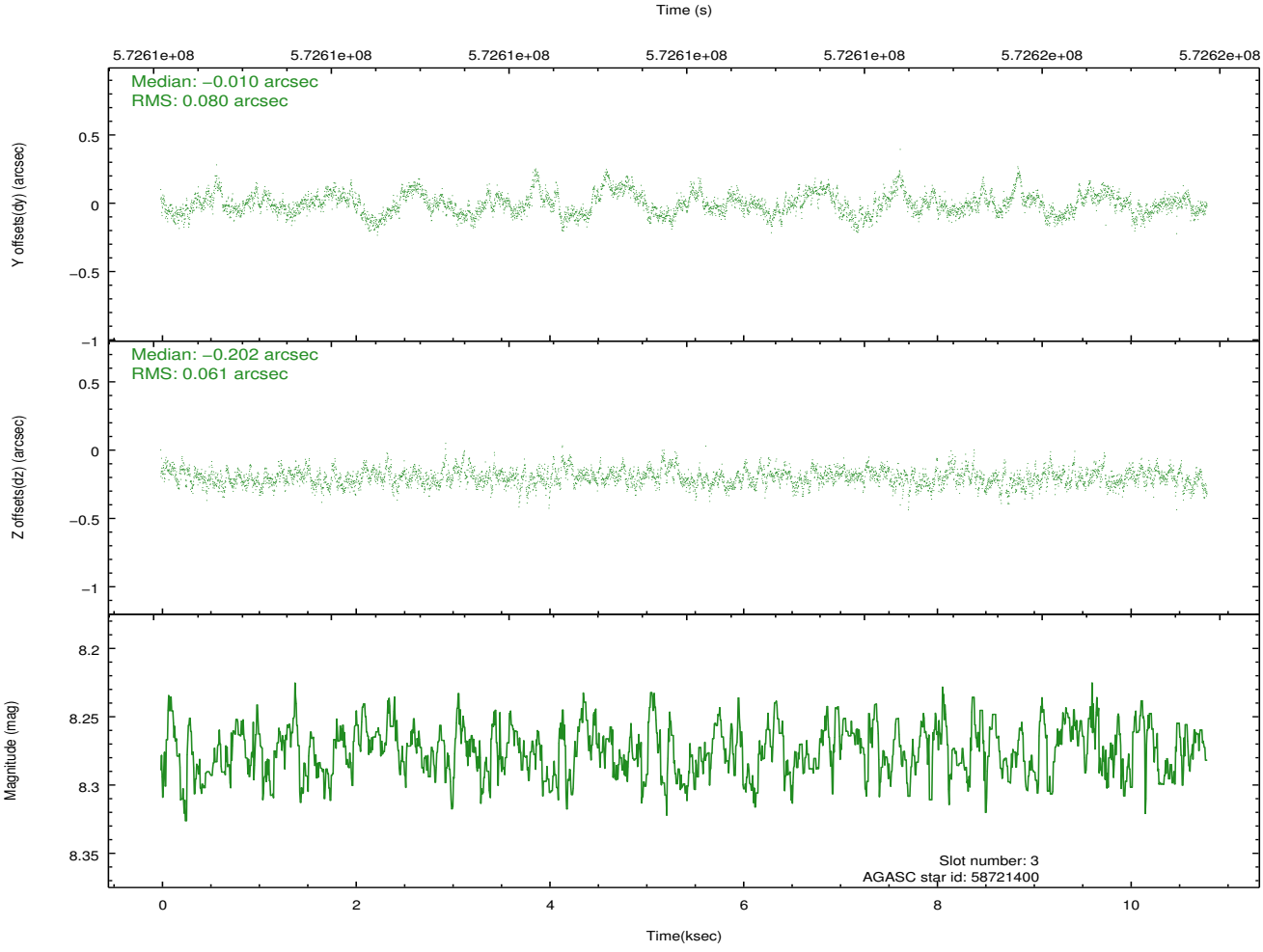
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-I-1	7.26	2634	-0.051	-0.095	0.012	0.021	0.000000	0.000000	920.96	-844.75
1	FID		ACIS-I-4	7.19	2634	0.401	0.113	0.012	0.021	0.000000	0.000000	2141.65	1055.07
2	FID		ACIS-I-5	7.25	2634	-0.448	0.051	0.008	0.015	0.000000	0.000000	-1826.90	1053.24
3	GUIDE	used	58721400	8.28	5269	-0.010	-0.202	0.107	0.174	282.817104	0.833240	565.58	1425.50
4	GUIDE	used	58852048	8.37	5270	0.016	0.213	0.106	0.174	283.366398	0.870285	1141.39	-469.62
5	GUIDE	used	58857104	9.16	5264	-0.044	0.453	0.135	0.259	283.814800	0.638238	691.44	-2230.59
6	GUIDE	used	58720672	7.90	5268	0.201	0.101	0.089	0.150	282.585114	0.078732	-2268.61	1627.54
7	GUIDE	used	58721432	8.57	5268	-0.158	-0.563	0.096	0.158	282.605647	0.791519	247.27	2133.72

2.4 Star Slots

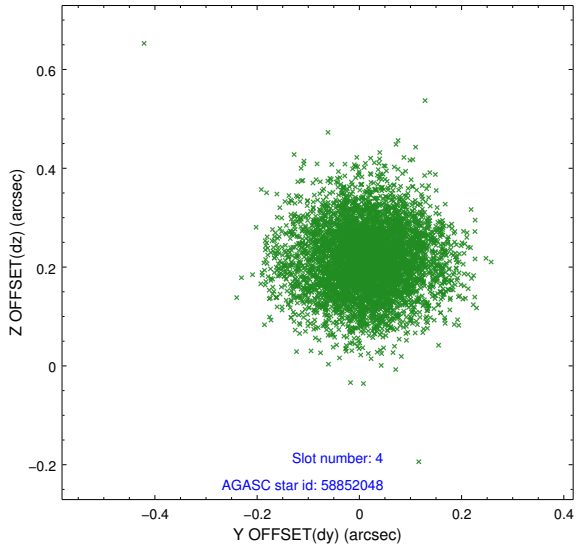
2.4.1 Slot 3

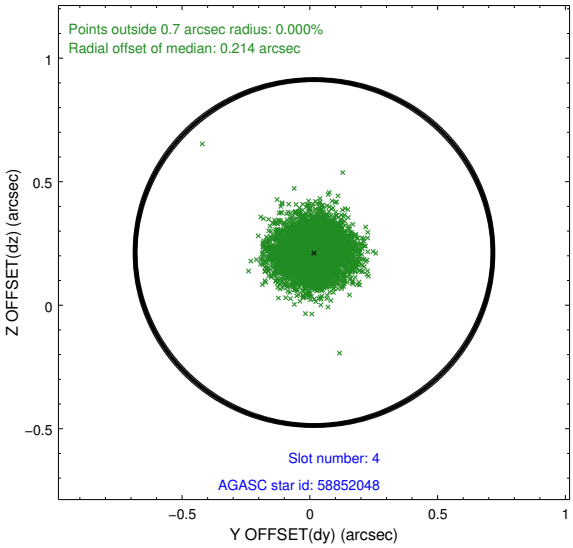


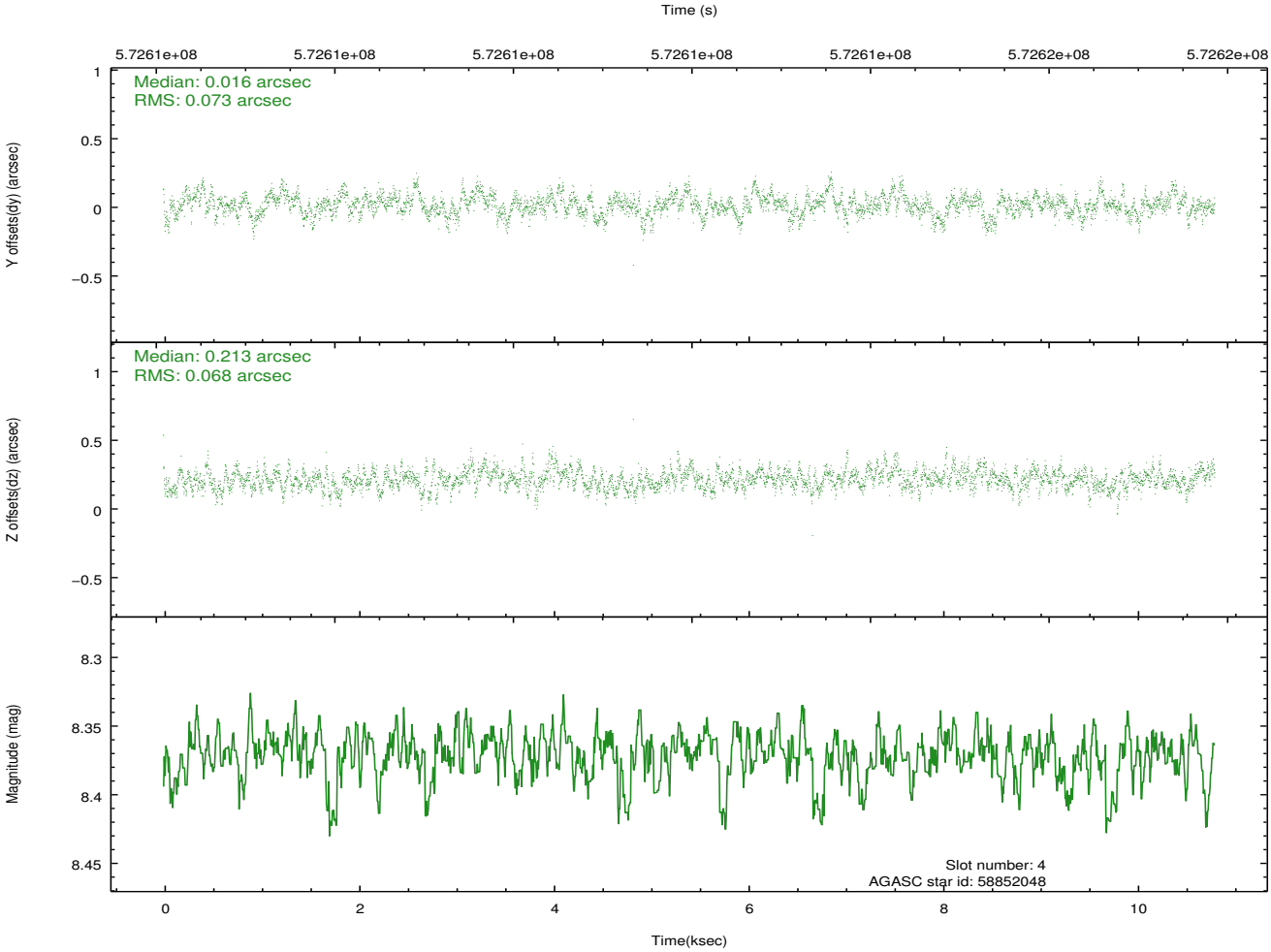




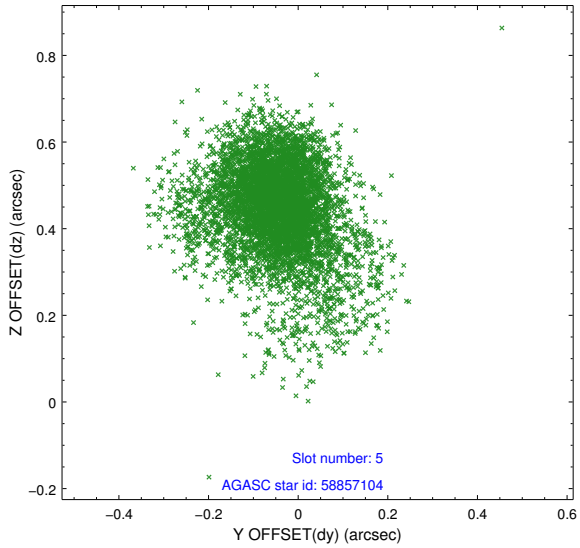
2.4.2 Slot 4

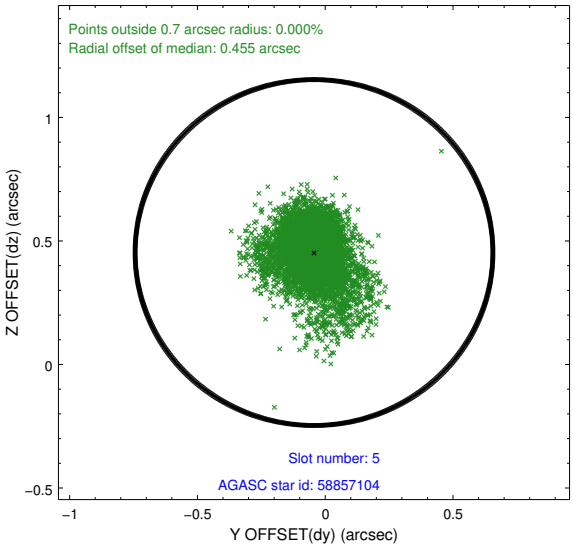

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 58852048

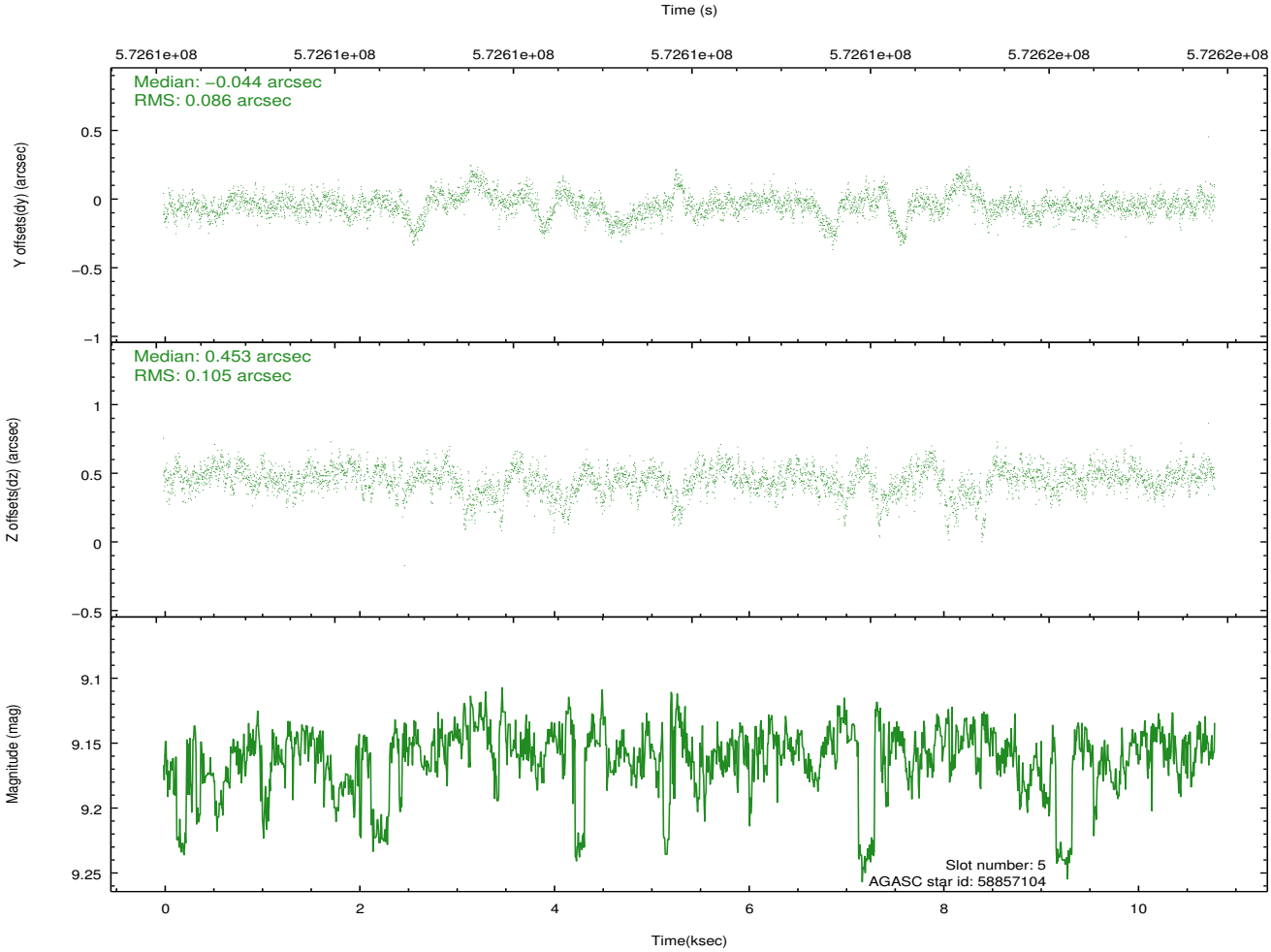

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.214 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 58852048


Time (s)
Median: 0.016 arcsec
RMS: 0.073 arcsec
Y offsets(dy) (arcsec)
Median: 0.213 arcsec
RMS: 0.068 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 58852048
Time(ksec)

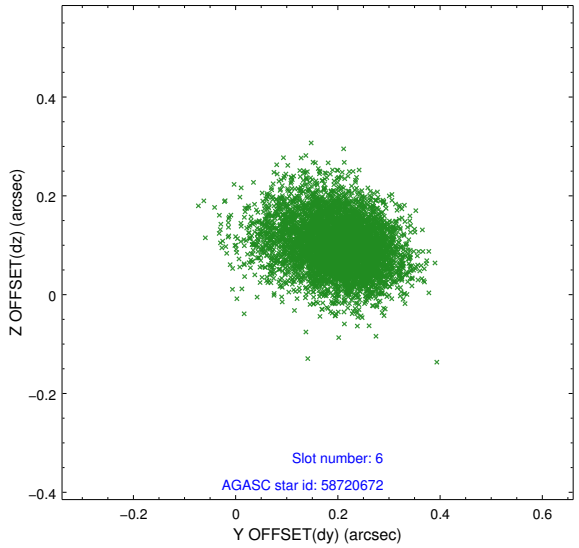
2.4.3 Slot 5

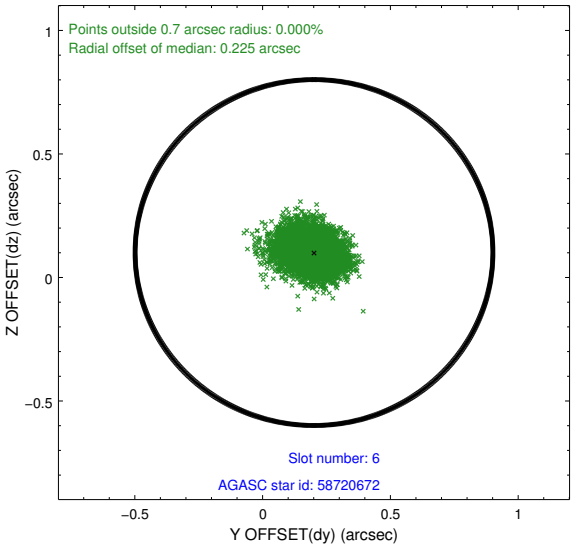

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 58857104

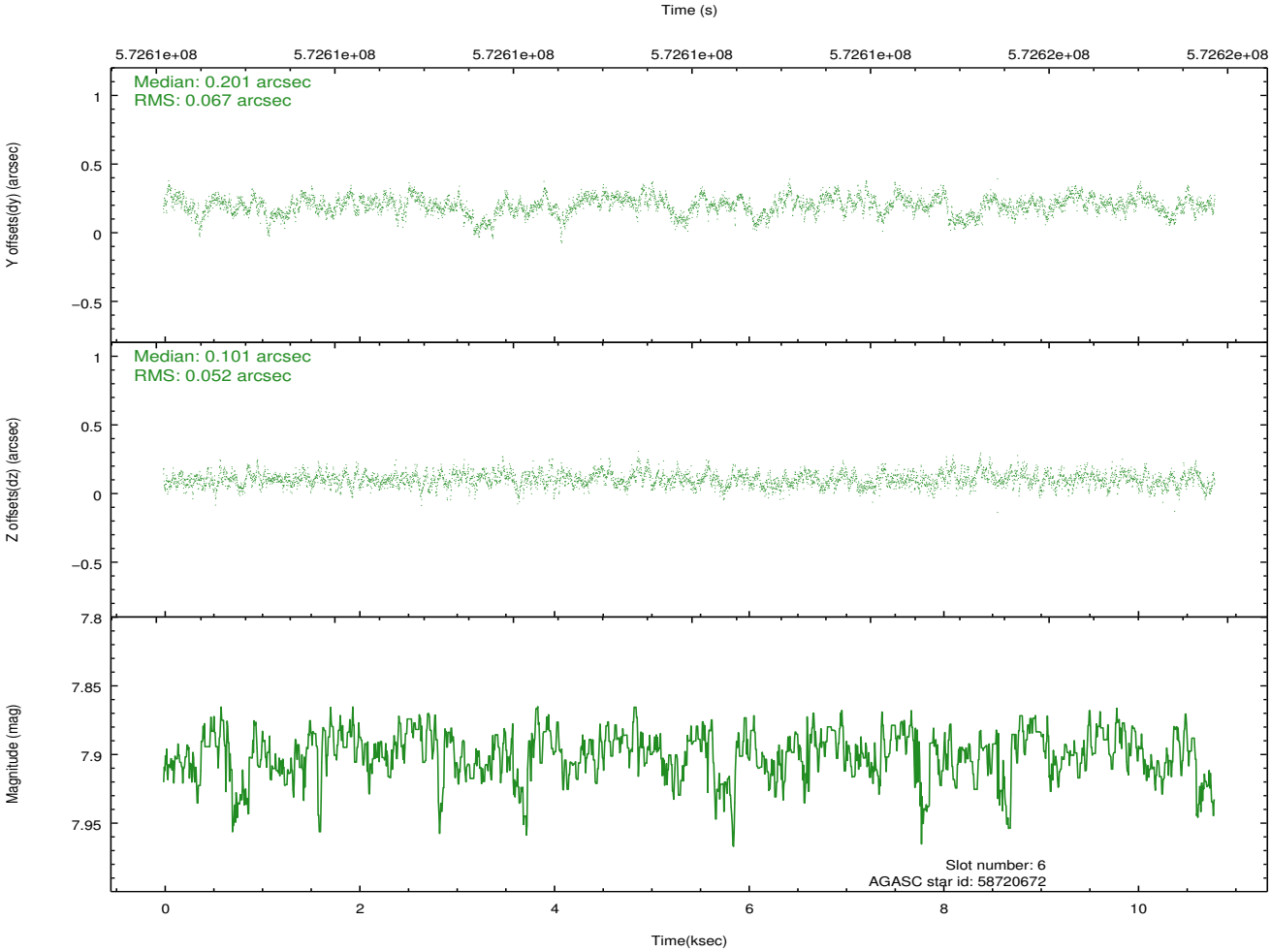

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.455 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 58857104


Time (s)
Median: −0.044 arcsec
RMS: 0.086 arcsec
Y offsets(dy) (arcsec)
Median: 0.453 arcsec
RMS: 0.105 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 58857104
Time(ksec)

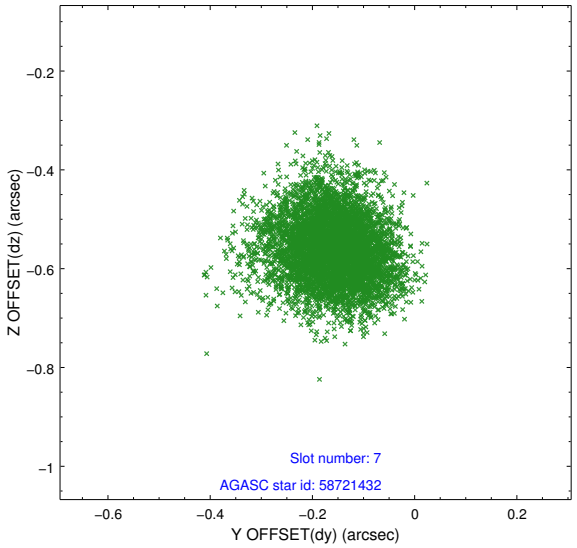
2.4.4 Slot 6

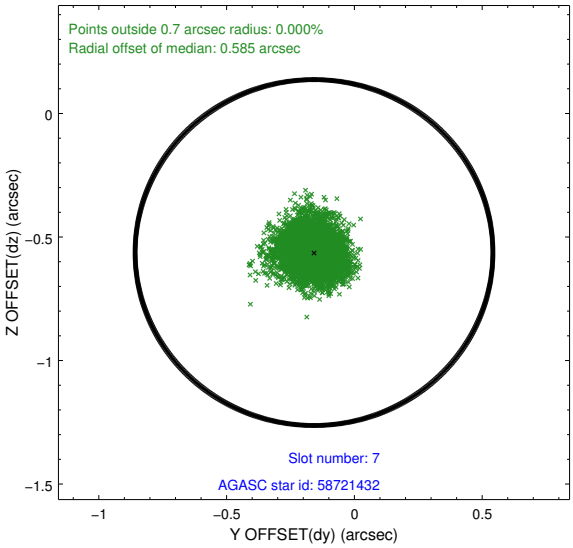

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 58720672

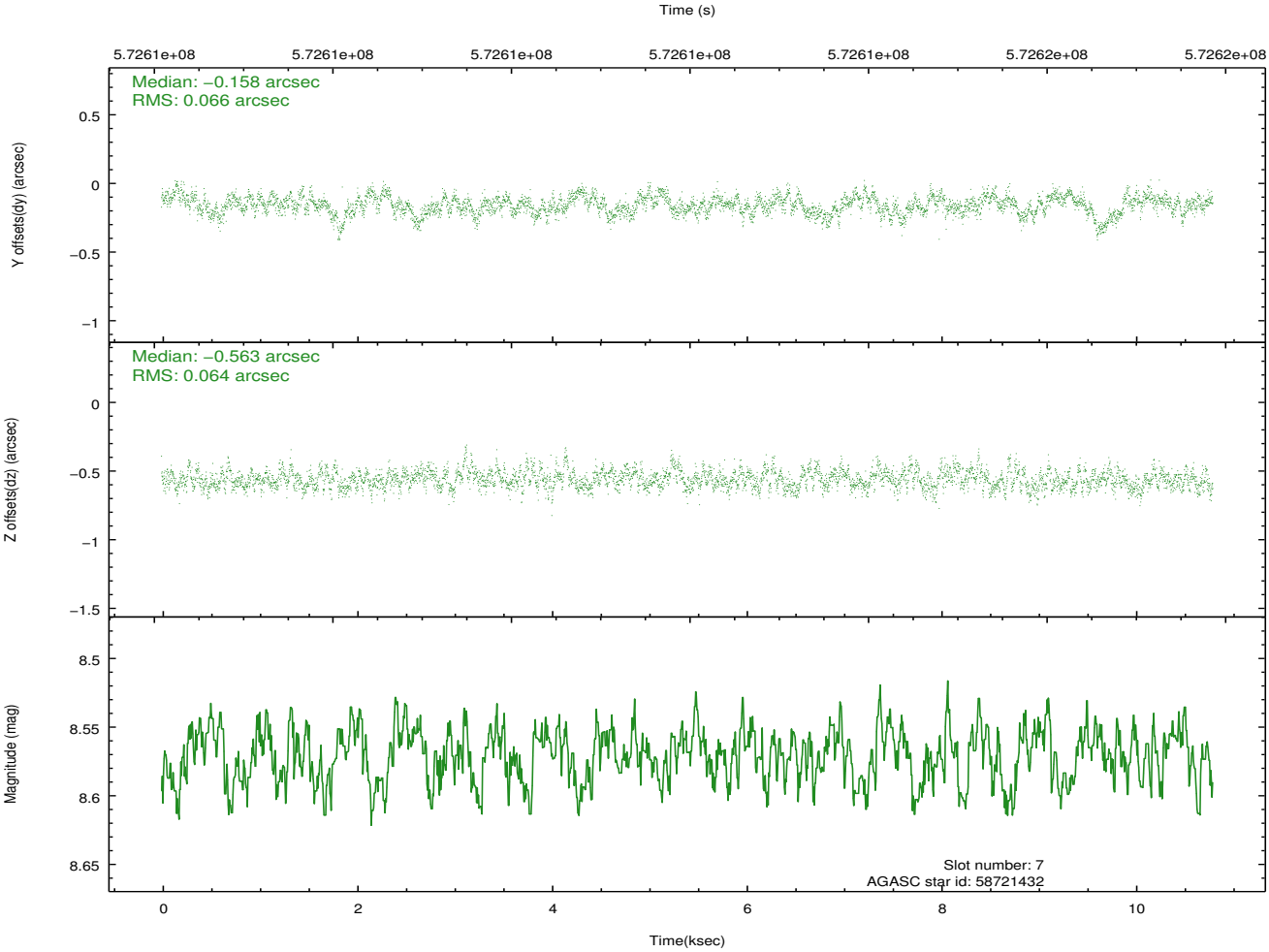

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.225 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 58720672


Time (s)
Median: 0.201 arcsec
RMS: 0.067 arcsec
Y offsets(dy) (arcsec)
Median: 0.101 arcsec
RMS: 0.052 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 58720672
Time(ksec)

2.4.5 Slot 7

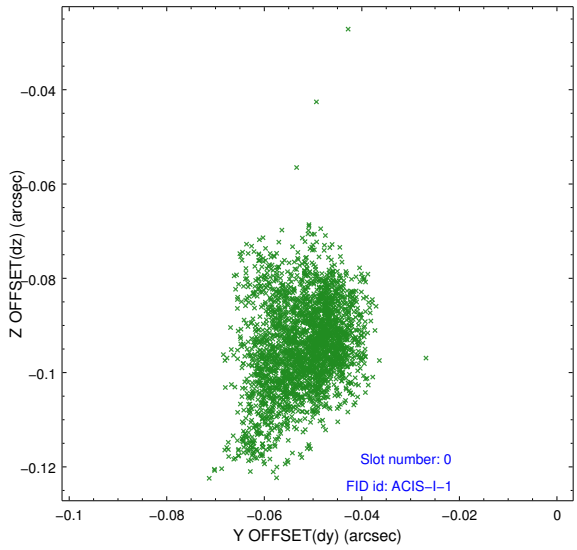

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 58721432

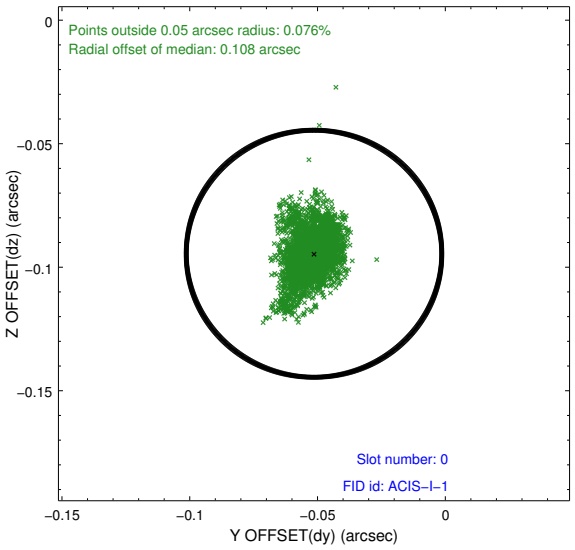

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.585 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 58721432

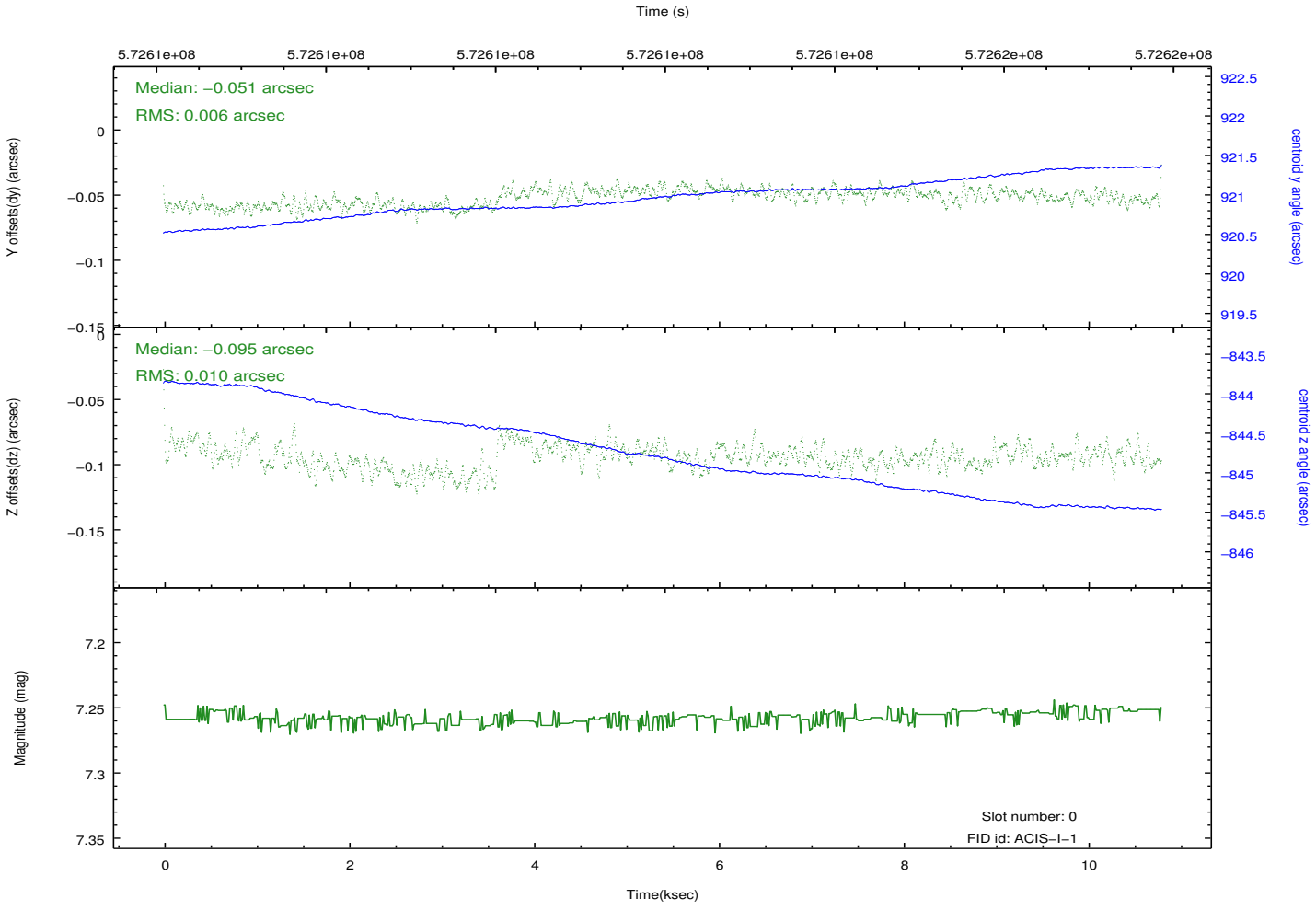

Time (s)
Median: −0.158 arcsec
RMS: 0.066 arcsec
Y offsets(dy) (arcsec)
Median: −0.563 arcsec
RMS: 0.064 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 58721432
Time(ksec)

2.5 FID Slots

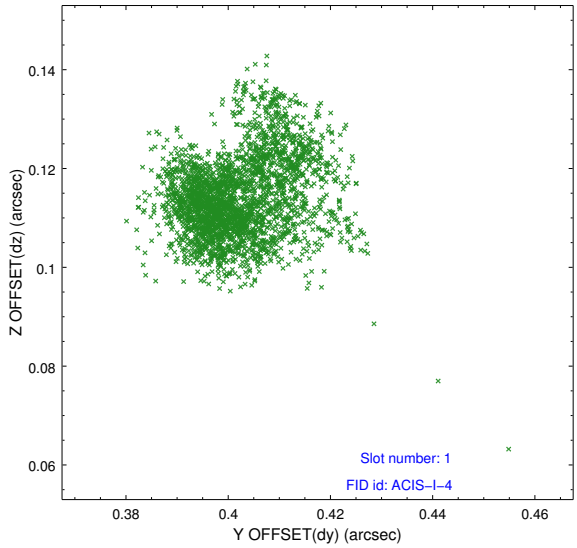
2.5.1 Slot 0

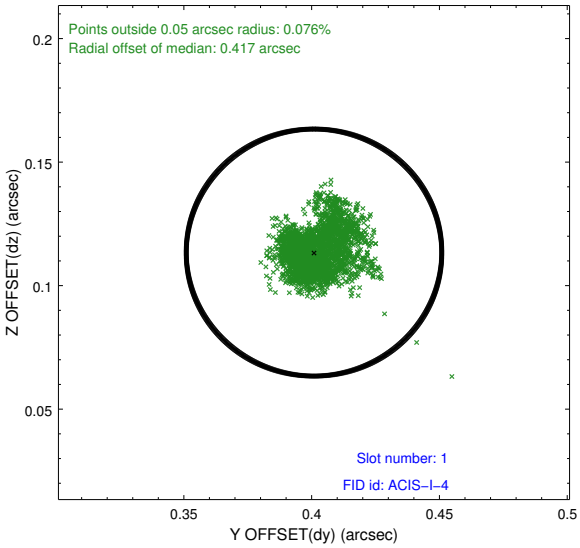


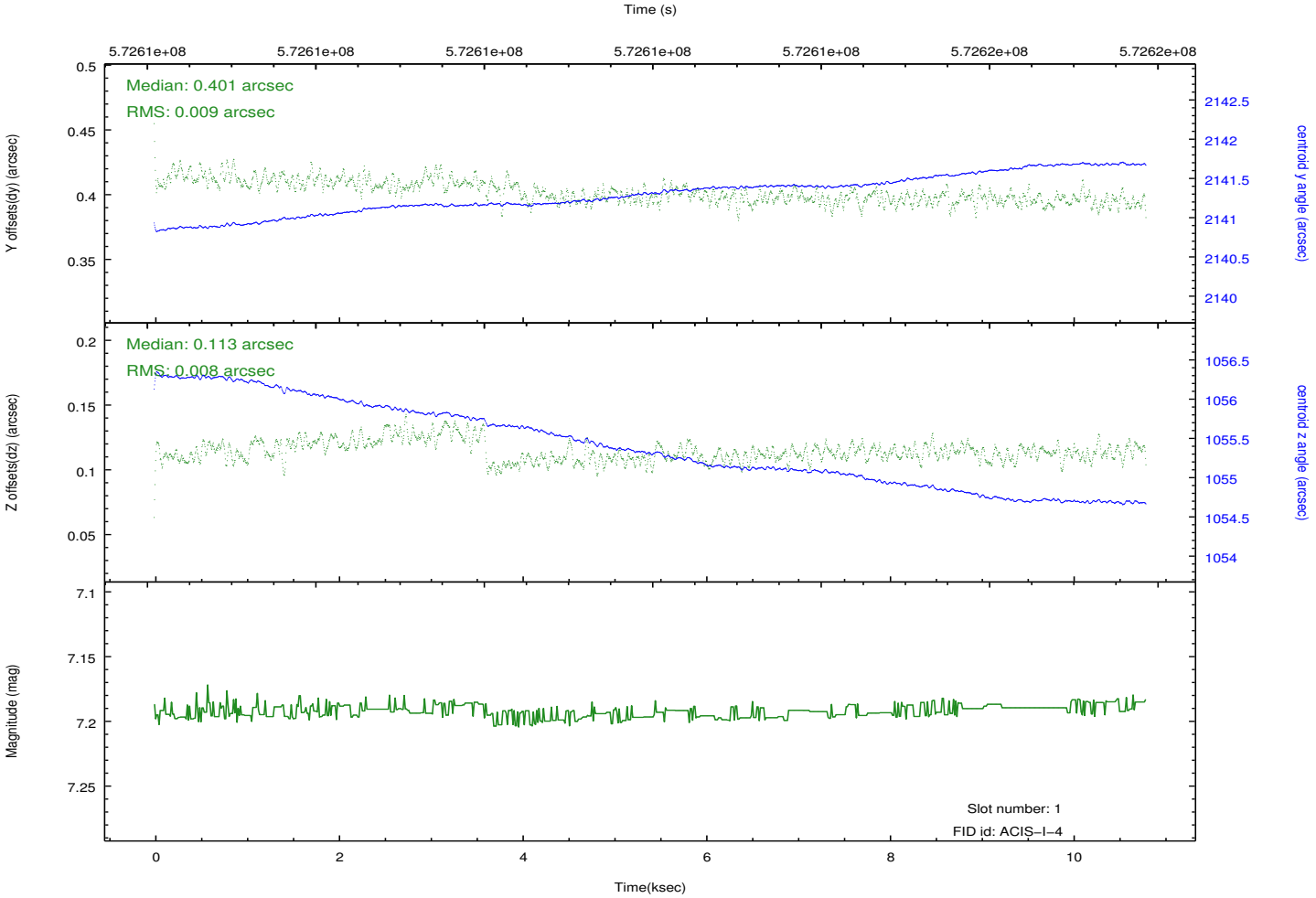




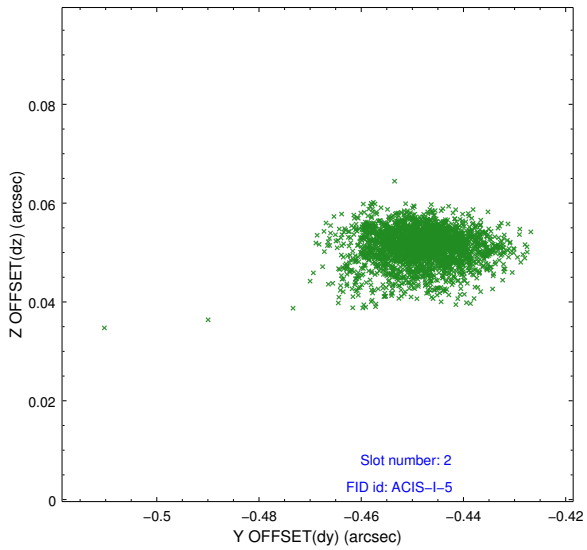
2.5.2 Slot 1

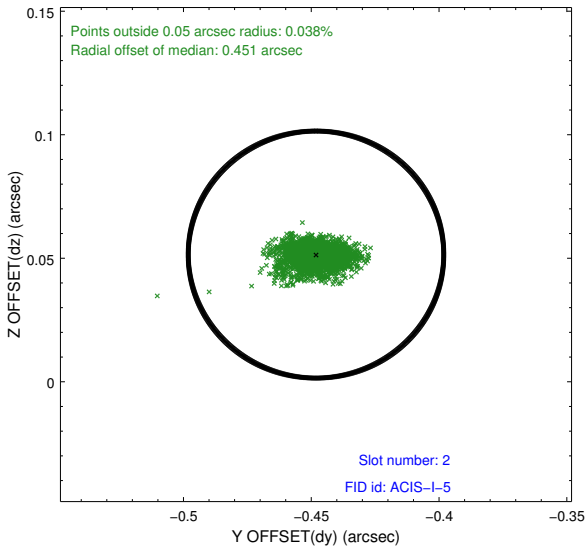

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS–I–4

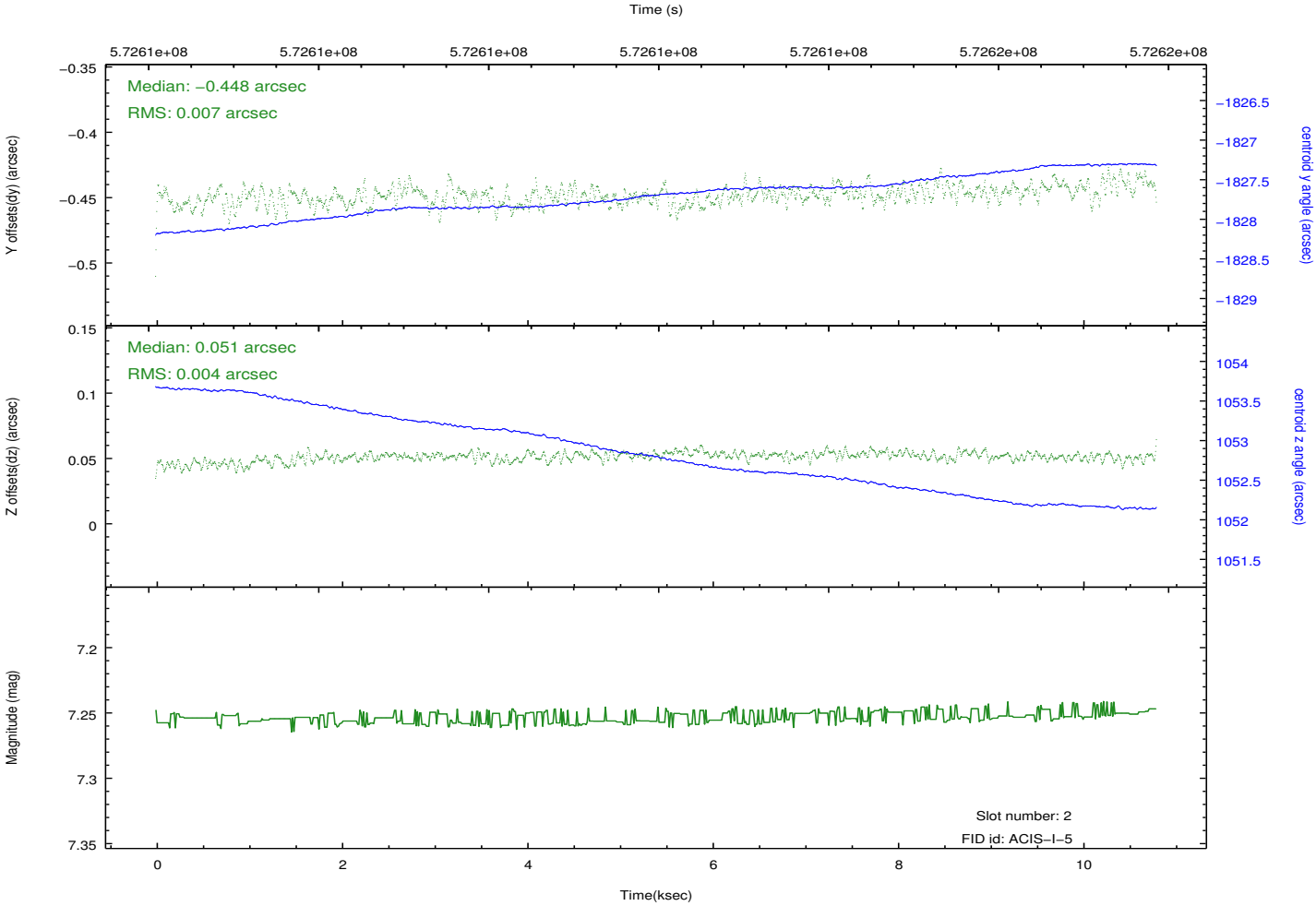

Points outside 0.05 arcsec radius: 0.076%
Radial offset of median: 0.417 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS–I–4


Time (s)
Median: 0.401 arcsec
RMS: 0.009 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.113 arcsec
RMS: 0.008 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 1
FID id: ACIS–I–4
Time(ksec)

2.5.3 Slot 2


Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−I−5


Points outside 0.05 arcsec radius: 0.038%
Radial offset of median: 0.451 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−I−5


Time (s)
Median: −0.448 arcsec
RMS: 0.007 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.051 arcsec
RMS: 0.004 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 2
FID id: ACIS−I−5
Time(ksec)

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	10.056400077462

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

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.