V&V Reference Report
L2 ASCDS Version : 10.5.2

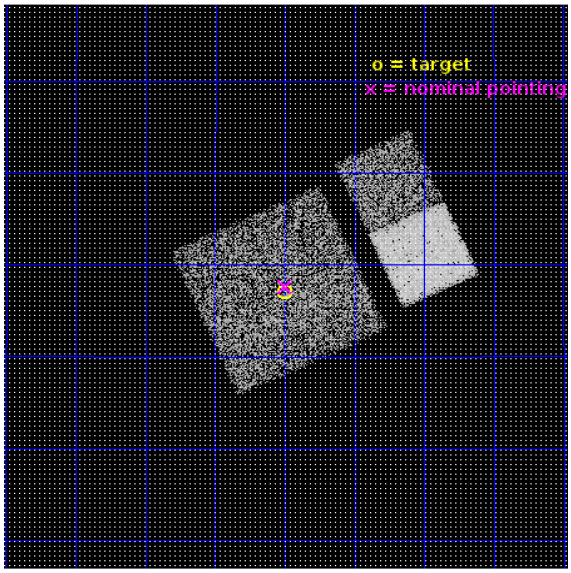
Observation 18973 - L2 Version 1
Chandra X-Ray Center

L2 Processing Date : Feb 24 2017

Contents

1 Front

seq_num	401841	Sequence number
obs_id	18973	Observation id
title	The Nature of INTEGRAL Sources in the Galactic Plane	Proposal titl
observer	John Tomsick	Principal investigator
object	IGR J19294+1327	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	292.374167	Observer's specified target RA [deg]
dec_targ	13.4515	Observer's specified target Dec [deg]
ra_nom	292.37395525746	Nominal RA [deg]
dec_nom	13.460332833616	Nominal Dec [deg]
roll_nom	65.382843786531	Nominal Roll [deg]
revision	1	Processing version of data
ontime	4940.8000736237	Sum of GTIs [s]
livetime	4878.2366880988	Livetime [s]
ontime0	4940.8000736237	Sum of GTIs [s]
ontime1	4940.8000736237	Sum of GTIs [s]
ontime2	4940.8000736237	Sum of GTIs [s]
ontime3	4940.8000736237	Sum of GTIs [s]
ontime6	4940.8000736237	Sum of GTIs [s]
ontime7	4940.8000736237	Sum of GTIs [s]
l2events	34407	Number of level 2 events

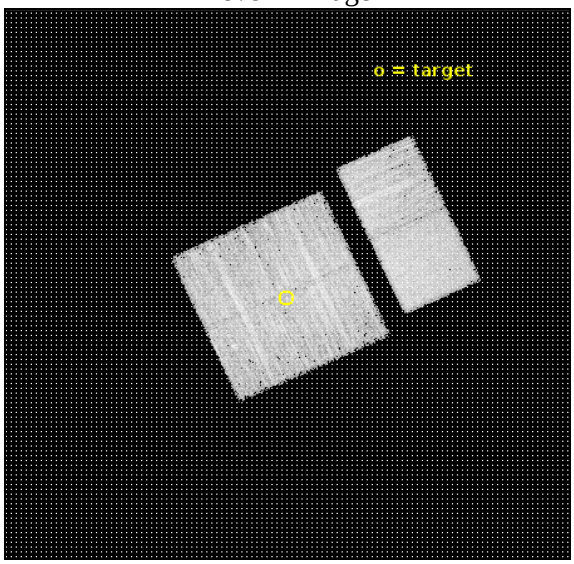


2 OBI

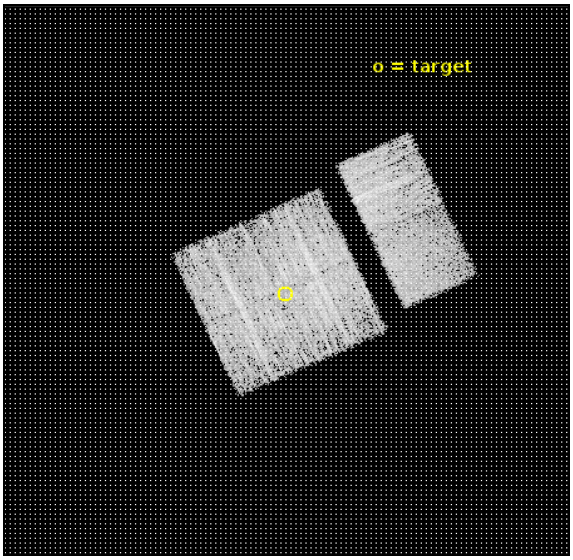
2.1 OBI

2.1.1 Images

Level 1 Image

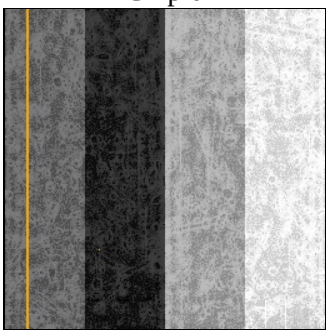


Level 1 Bad Events

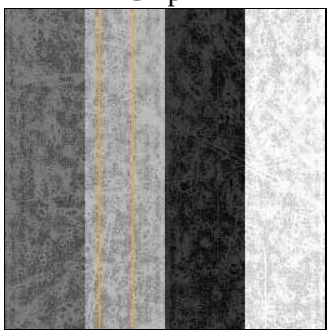


2.1.2 Bias

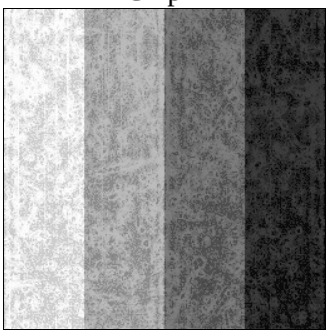
Chip 0



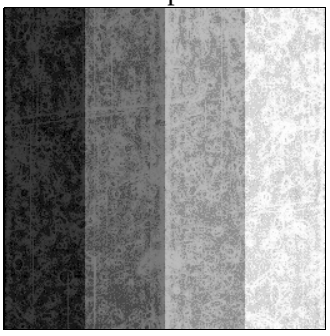
Chip 1



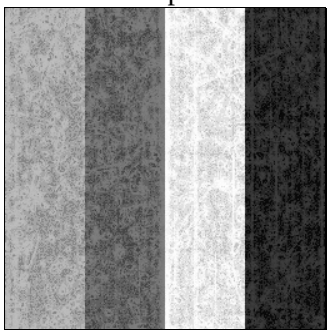
Chip 2



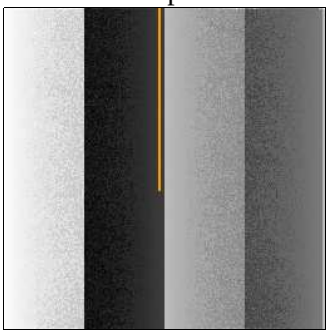
Chip 3



Chip 6



Chip 7



2.1.3 Parameters

obi_num	0	Obi number
ascdsver	10.5.2	Processing system revision
caldbver	4.7.3	
date	2017-02-24T14:36:13	Date and time of file creation
revision	1	Processing version of data

sched_exp_time	5000.000000	[s] Scheduled observation exposure time
ontime	4940.8000736237	Sum of GTIs [s]
ontime0	4940.8000736237	Sum of GTIs [s]
ontime1	4940.8000736237	Sum of GTIs [s]
ontime2	4940.8000736237	Sum of GTIs [s]
ontime3	4940.8000736237	Sum of GTIs [s]
ontime6	4940.8000736237	Sum of GTIs [s]
ontime7	4940.8000736237	Sum of GTIs [s]
l1events	224367	Number of level 1 events

2.1.4 Events

	ccd 0	**ccd 1**	**ccd 2**	**ccd 3**	**ccd 6**	**ccd 7**
level 1 events	34145	34950	36486	36533	37799	44454
rejected events	30450	30687	32774	32884	33939	25791
rejected %	89%	87%	89%	90%	89%	58%

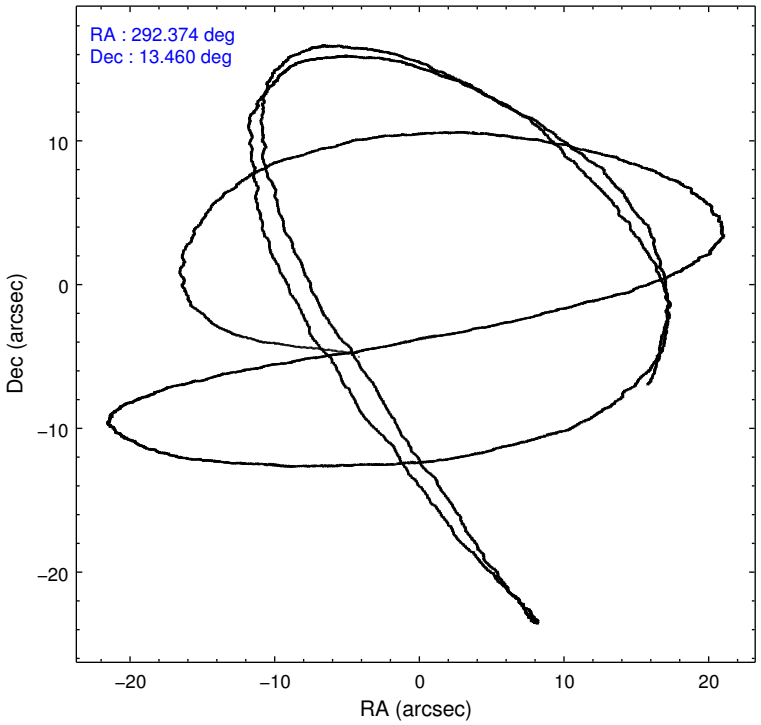
	ccd 0	**ccd 1**	**ccd 2**	**ccd 3**	**ccd 6**	**ccd 7**
grade 0 events	1215	1564	1381	1282	1109	1357
	3%	4%	3%	3%	2%	3%
grade 1 events	17	14	25	22	9	76
	0%	0%	0%	0%	0%	0%
grade 2 events	946	1046	822	752	1014	4052
	2%	2%	2%	2%	2%	9%
grade 3 events	374	353	392	380	327	1337
	1%	1%	1%	1%	0%	3%
grade 4 events	363	325	362	412	353	1291
	1%	0%	0%	1%	0%	2%
grade 5 events	1367	1372	1270	1503	1507	4110
	4%	3%	3%	4%	3%	9%
grade 6 events	802	978	761	828	1061	10641
	2%	2%	2%	2%	2%	23%
grade 7 events	29061	29298	31473	31354	32419	21590
	85%	83%	86%	85%	85%	48%

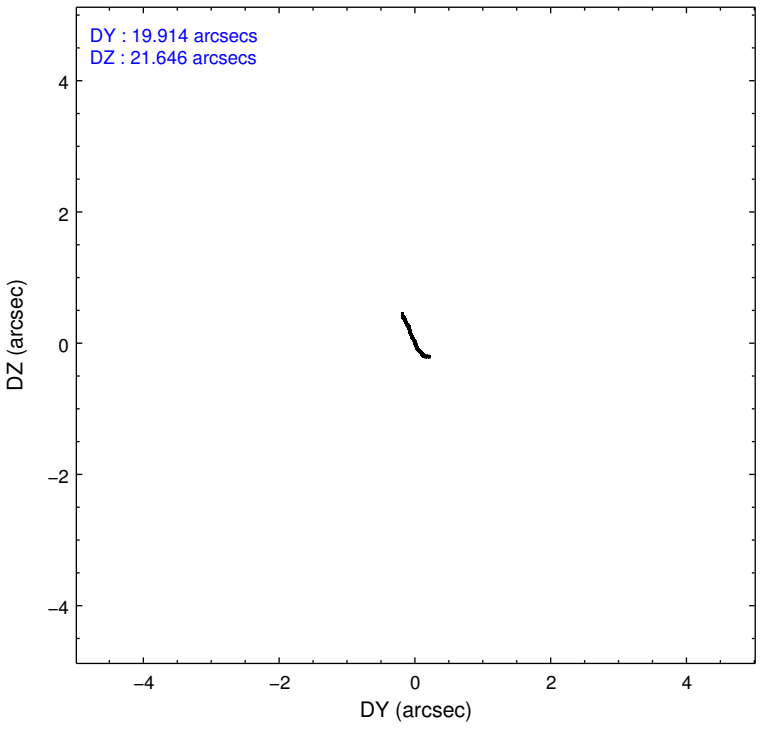
2.2 Compared Parameters

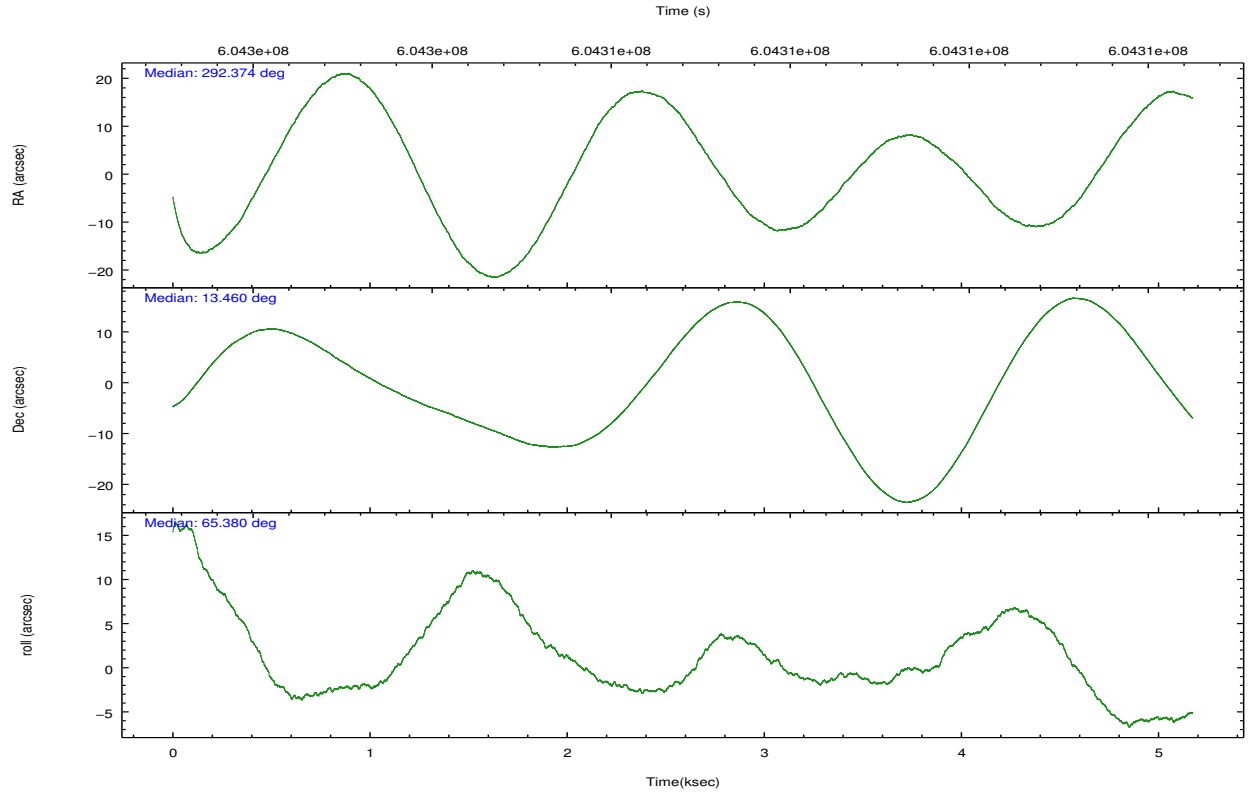
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-012367	ACIS-012367
Grating	NONE	NONE
Data mode	VFAINT	VFAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	292.376621	292.3739552574613
[deg] Pointing Dec	13.432365	13.46033283361563
[deg] Pointing Roll	65.173534	65.3828437865312
[mm] 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)	604303999.184000	604302741.8473099
Observation start date	2017-02-24T06:12:10	2017-02-24T05:52:21
[s] Observation end time (MET)	604308999.184000	604309557.0727
Observation end date	2017-02-24T07:35:30	2017-02-24T07:45:57
Read mode	TIMED	TIMED

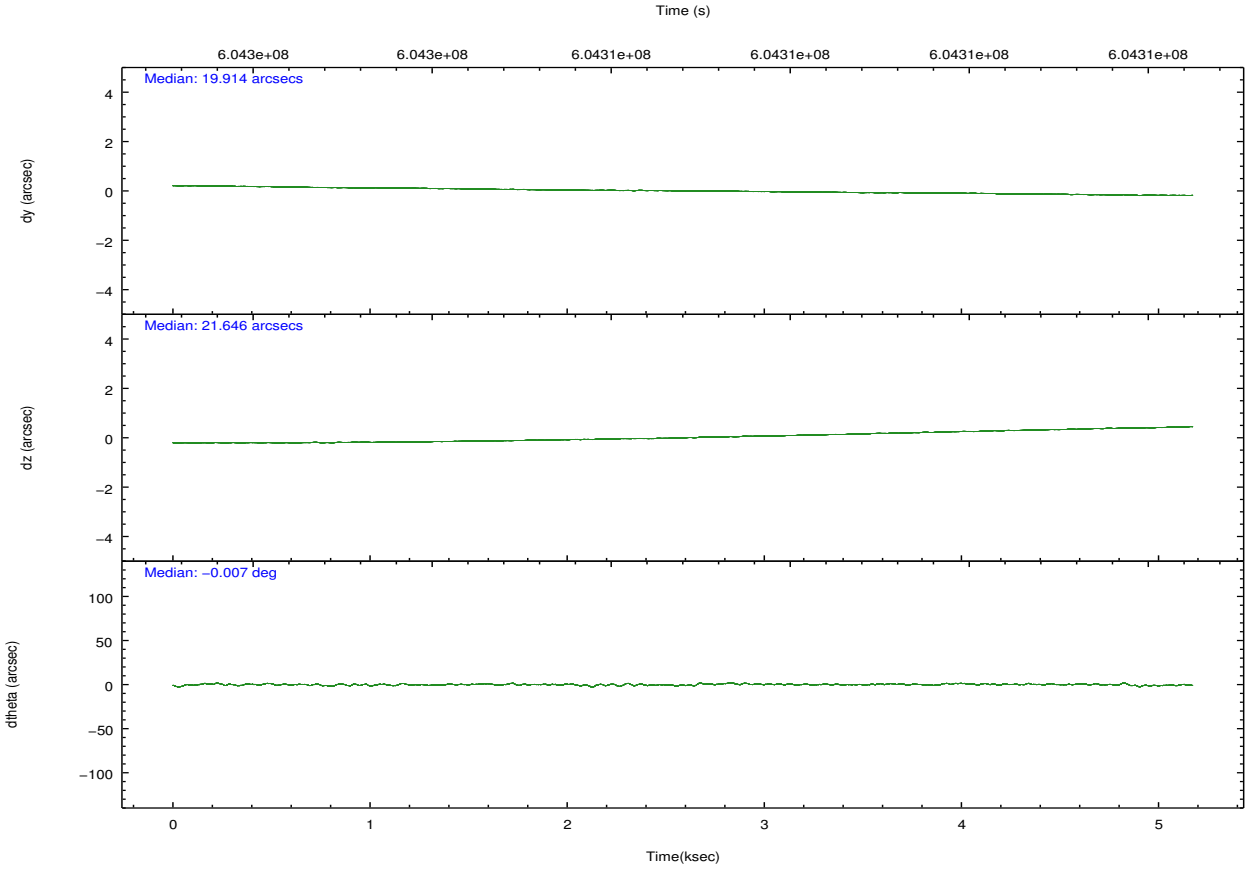
Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
CCD I0 on	Y	Y
CCD I1 on	Y	Y
CCD I2 on	Y	Y
CCD I3 on	Y	Y
CCD S0 on	N	N
CCD S1 on	N	N
CCD S2 on	O1	Y
CCD S3 on	O2	Y
CCD S4 on	N	N
CCD S5 on	N	N
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	NONE	NONE
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	3.2

2.3 Aspect


RA : 292.374 deg
Dec : 13.460 deg
Dec (arcsec)
RA (arcsec)
10
0
−10
−20
−20
−10
0
10
20


DY : 19.914 arcsecs
DZ : 21.646 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−4
−2
0
2
4


Time (s)
6.043e+08
6.043e+08
6.0431e+08
6.0431e+08
6.0431e+08
6.0431e+08
Median: 292.374 deg
RA (arcsec)
Median: 13.460 deg
Dec (arcsec)
Median: 65.380 deg
roll (arcsec)
Time(ksec)

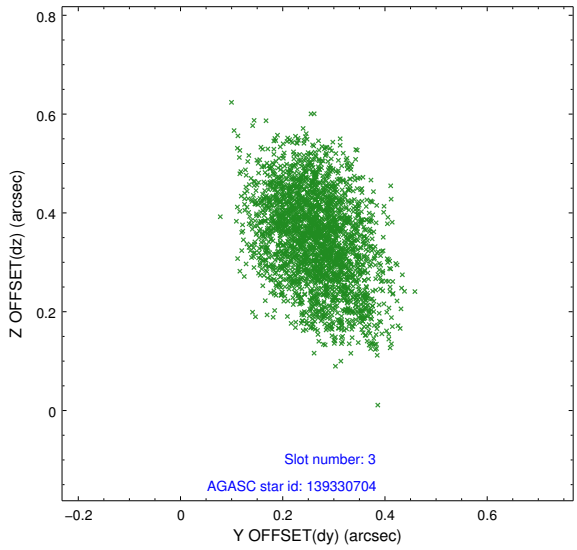

Time (s)
6.043e+08
6.043e+08
6.0431e+08
6.0431e+08
6.0431e+08
6.0431e+08
Median: 19.914 arcsecs
dy (arcsec)
Median: 21.646 arcsecs
dz (arcsec)
Median: −0.007 deg
dtheta (arcsec)
Time(ksec)

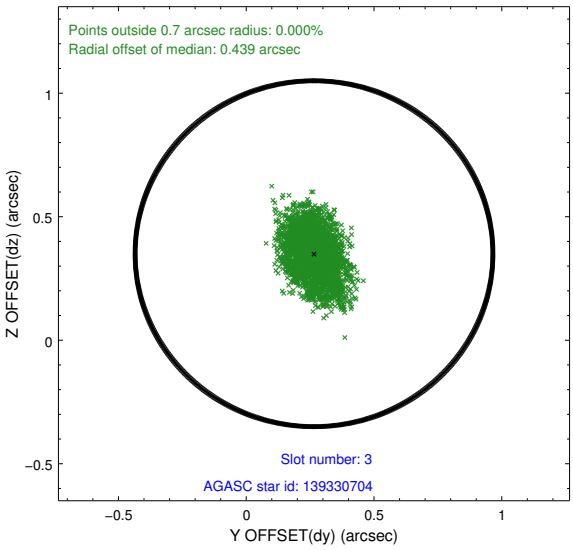
Slot Statistics

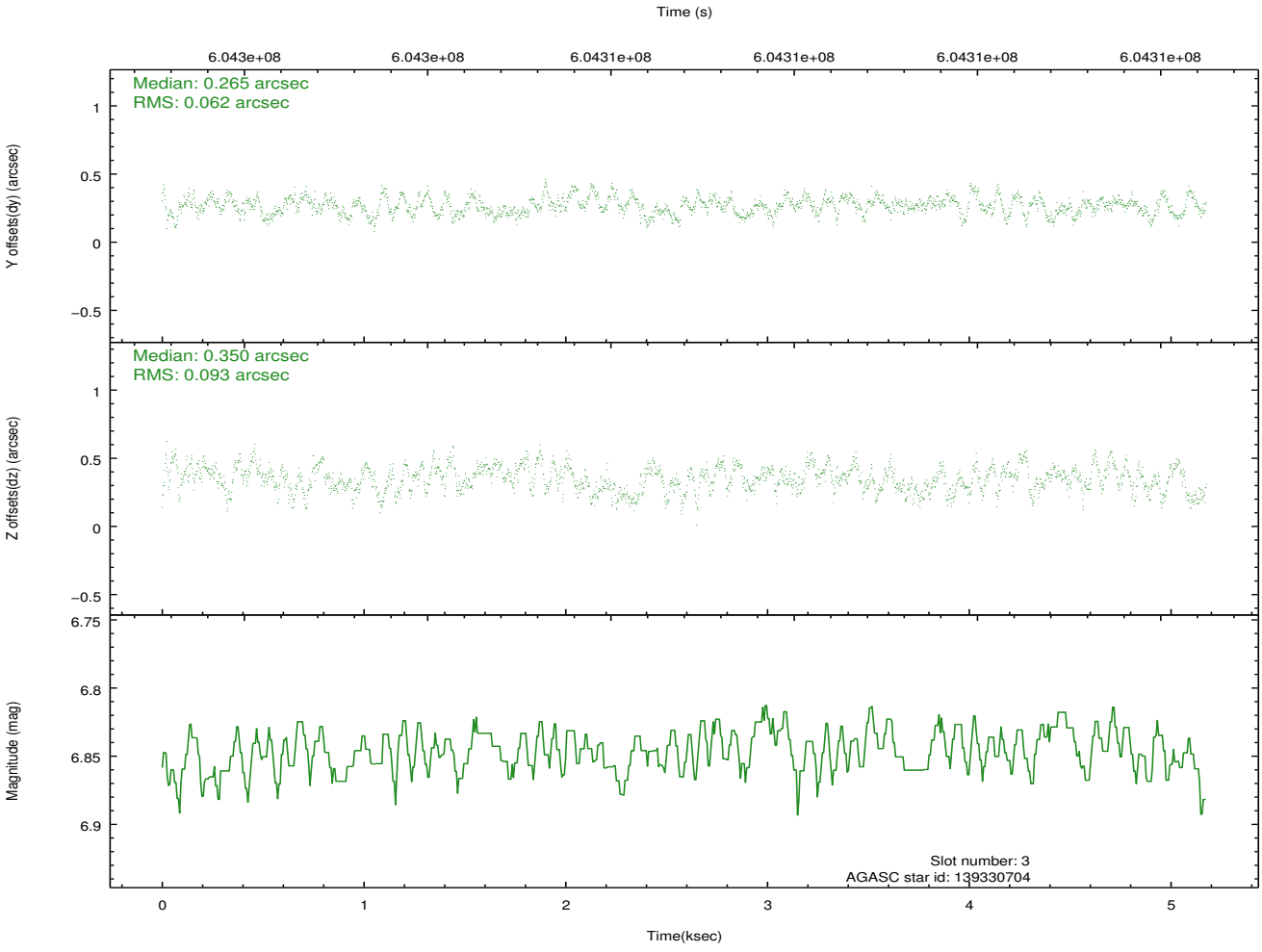
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-I-4	7.26	1262	0.395	0.056	0.009	0.016	0.000000	0.000000	2139.67	1054.65
1	FID		ACIS-I-5	7.32	1261	-0.568	0.023	0.009	0.015	0.000000	0.000000	-1827.75	1052.81
2	FID		ACIS-I-6	7.34	1262	0.074	-0.012	0.014	0.024	0.000000	0.000000	383.60	1697.28
3	GUIDE	used	139330704	6.85	2525	0.265	0.350	0.119	0.192	292.632068	12.816895	-1636.51	-1743.07
4	GUIDE	used	139335728	7.89	2525	0.062	0.199	0.112	0.193	292.250027	12.858184	-2064.48	-465.45
5	GUIDE	used	139861200	8.57	2522	0.147	0.176	0.116	0.190	292.302138	13.185412	-918.20	-136.80
6	GUIDE	used	139861448	8.28	2525	-0.638	-0.783	0.125	0.196	292.012166	14.072362	1555.09	2121.86
7	GUIDE	used	140001520	9.32	2519	0.157	0.058	0.214	0.356	293.204954	13.752143	2264.95	-2142.78

2.4 Star Slots

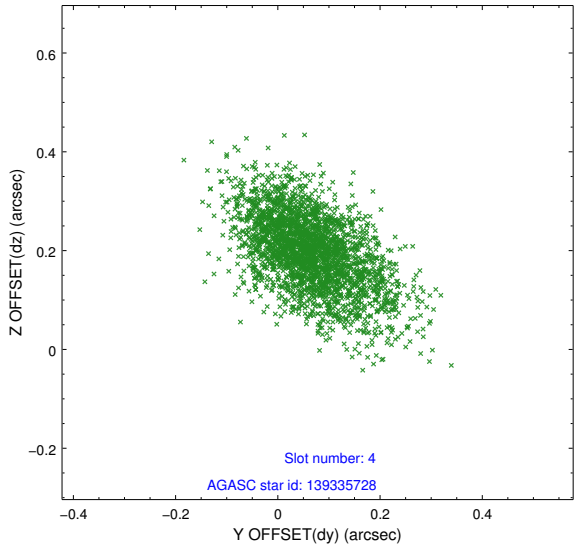
2.4.1 Slot 3

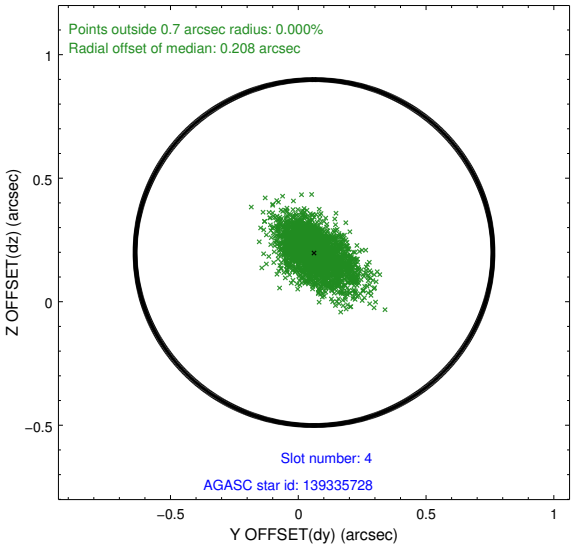


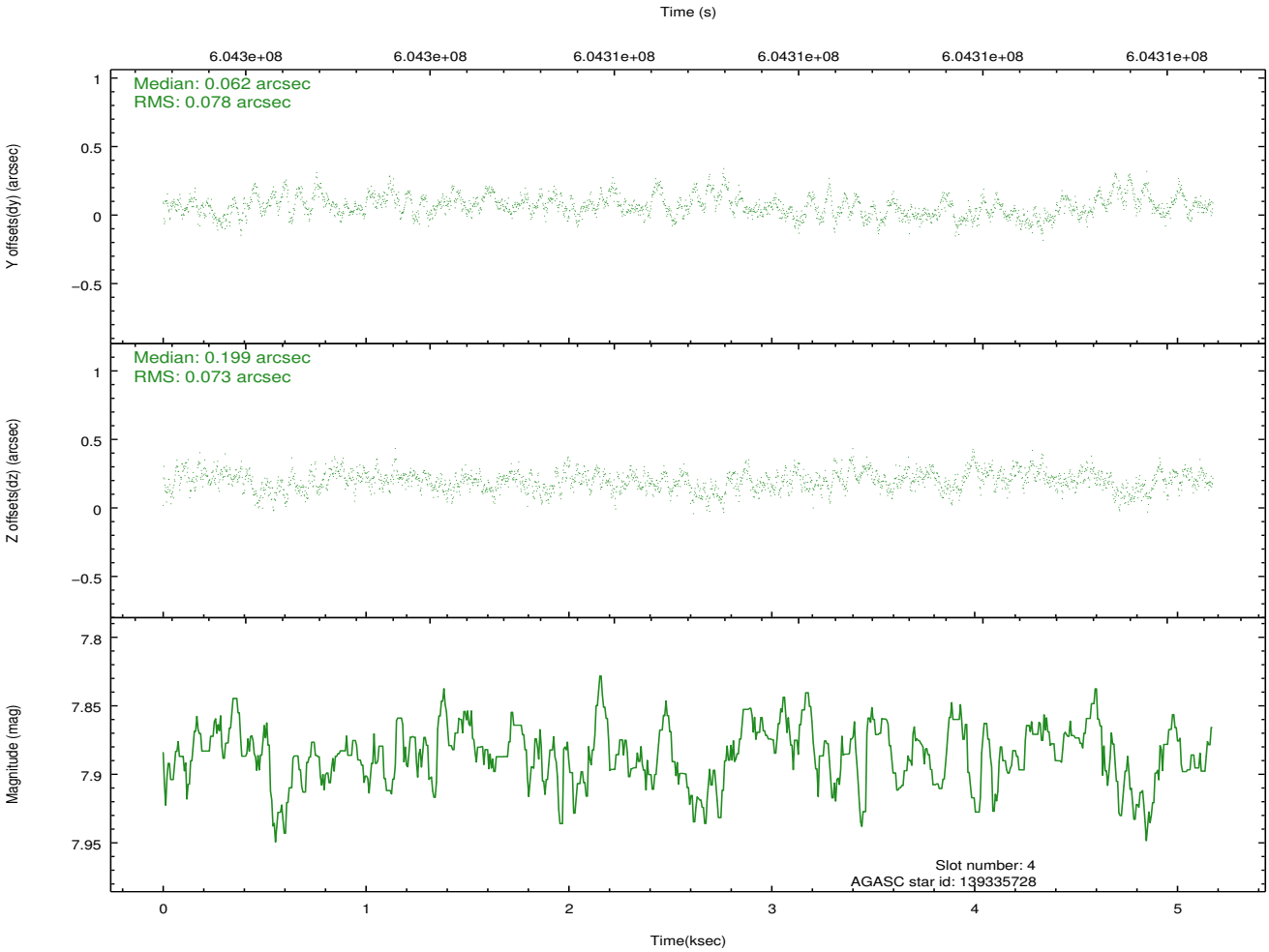




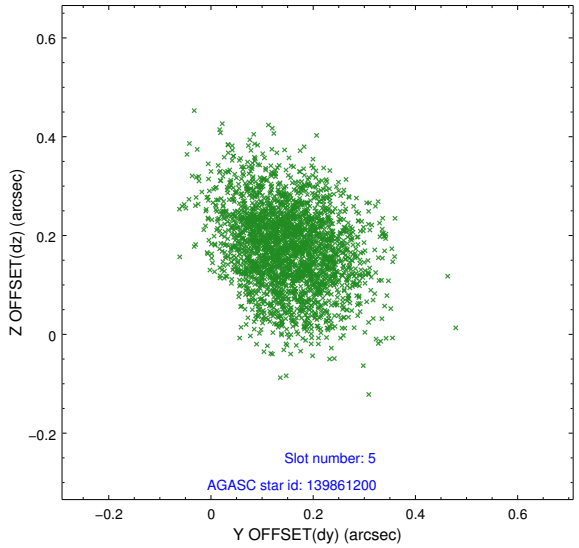
2.4.2 Slot 4

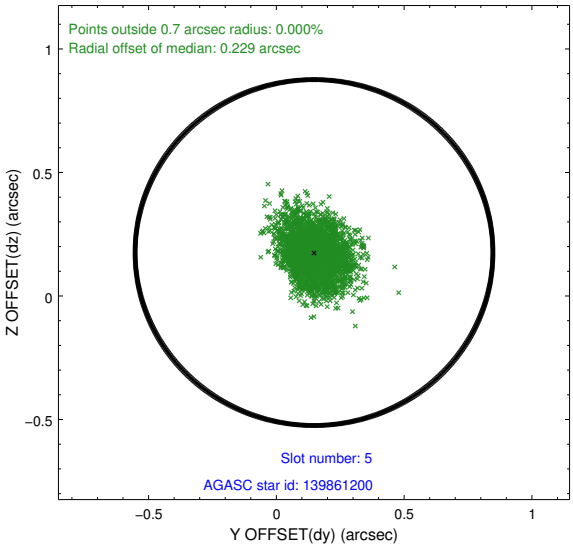

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 139335728

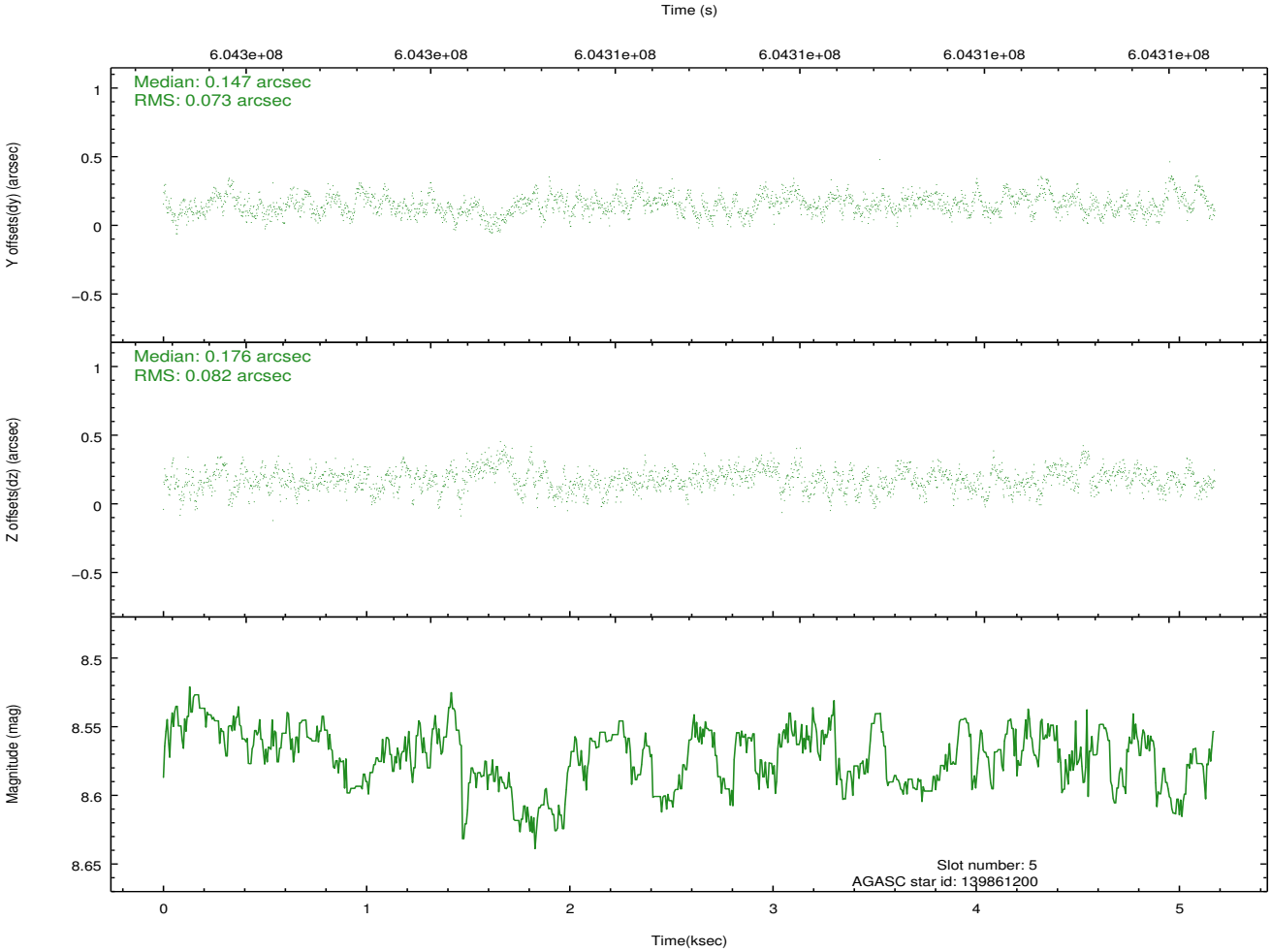

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.208 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 139335728


Time (s)
Median: 0.062 arcsec
RMS: 0.078 arcsec
Y offsets(dy) (arcsec)
Median: 0.199 arcsec
RMS: 0.073 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 139335728
Time(ksec)

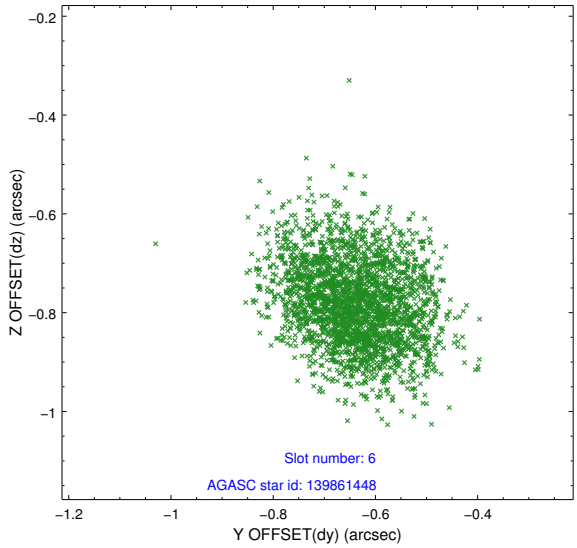
2.4.3 Slot 5

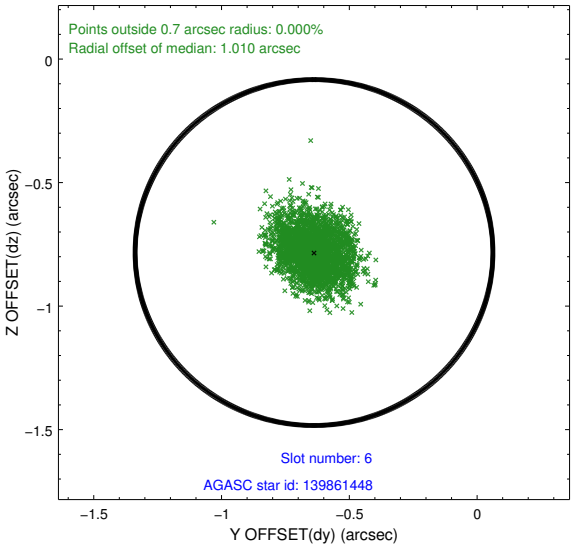

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 139861200

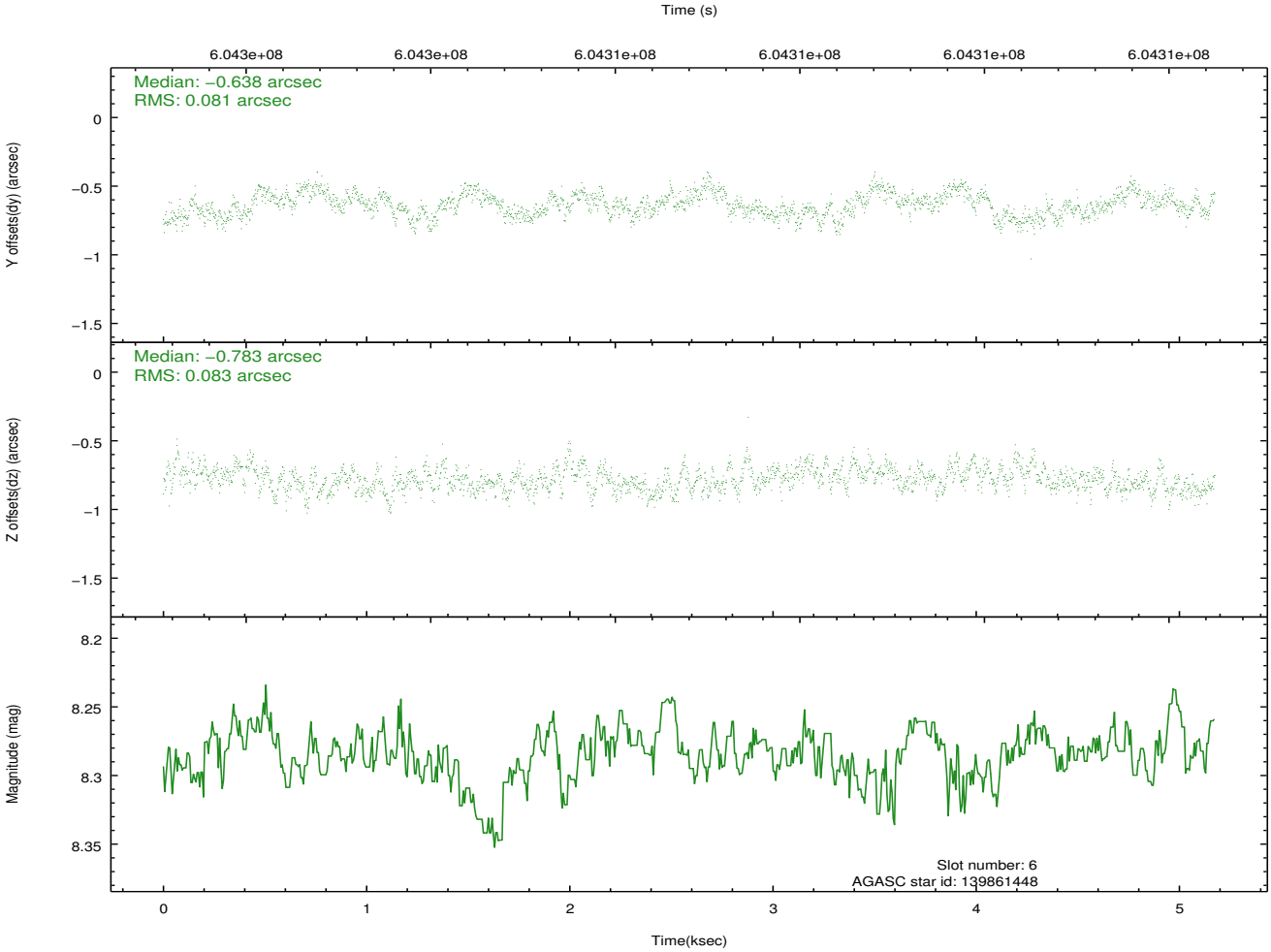

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.229 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 139861200


Time (s)
Median: 0.147 arcsec
RMS: 0.073 arcsec
Y offsets(dy) (arcsec)
Median: 0.176 arcsec
RMS: 0.082 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 139861200
Time(ksec)

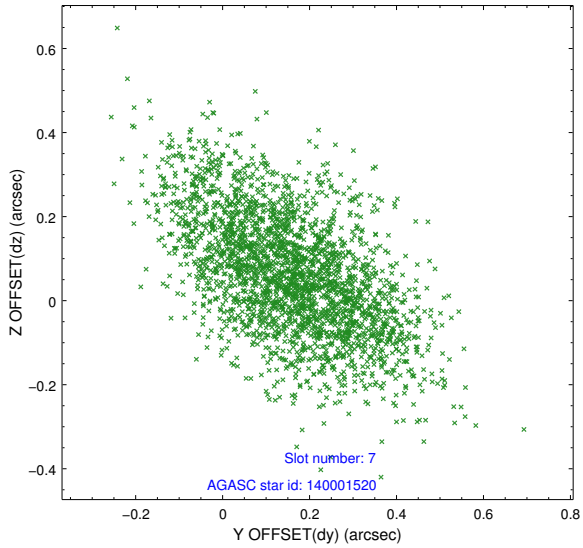
2.4.4 Slot 6

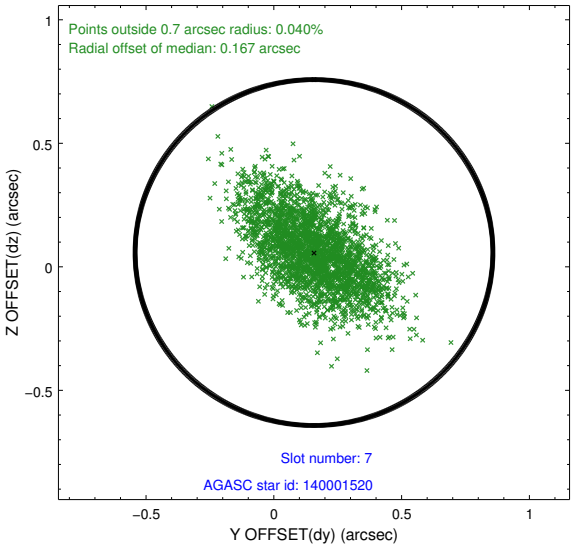

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 139861448

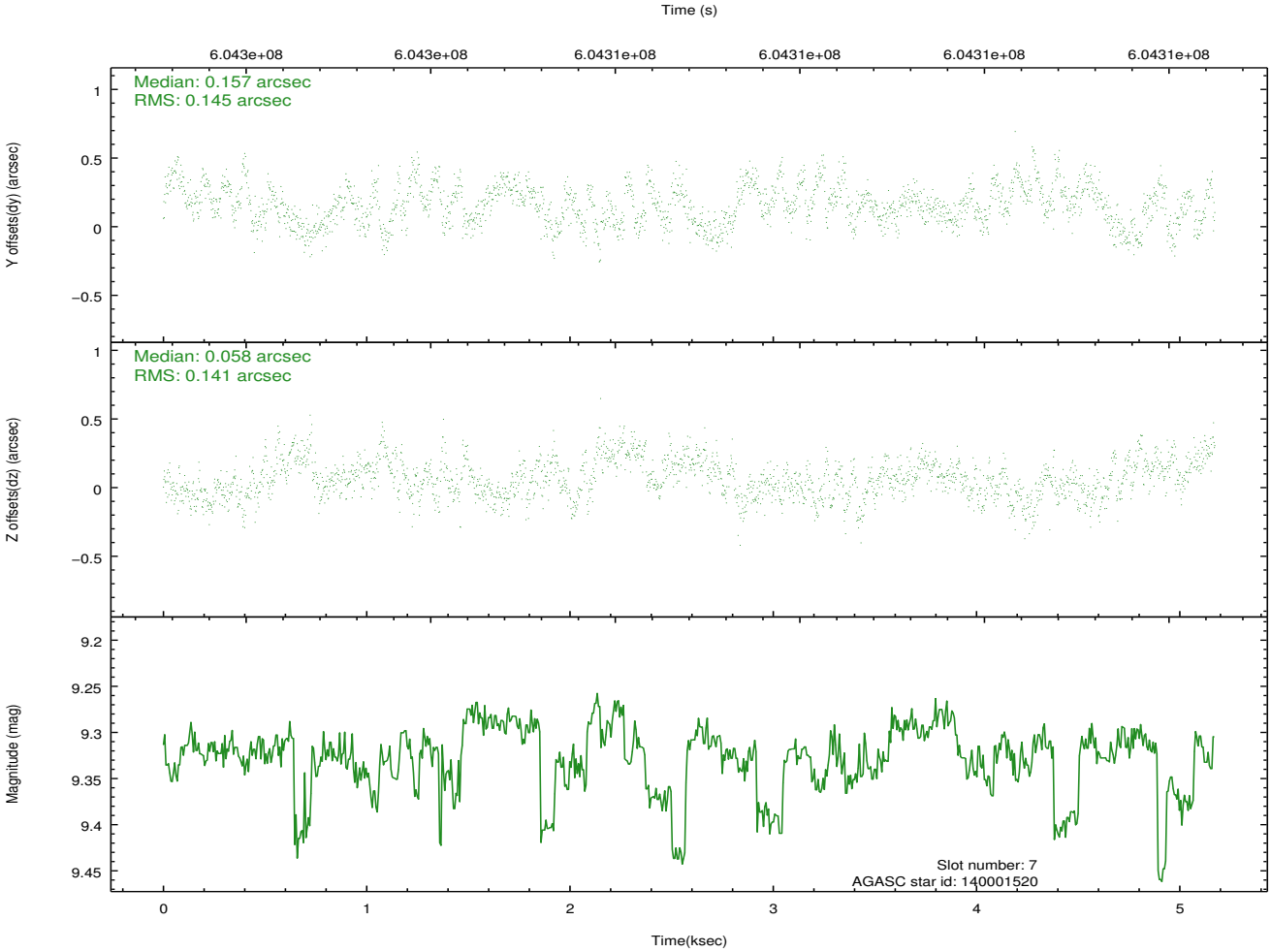

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 1.010 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 139861448


Time (s)
Median: −0.638 arcsec
RMS: 0.081 arcsec
Y offsets(dy) (arcsec)
Median: −0.783 arcsec
RMS: 0.083 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 139861448
Time(ksec)

2.4.5 Slot 7

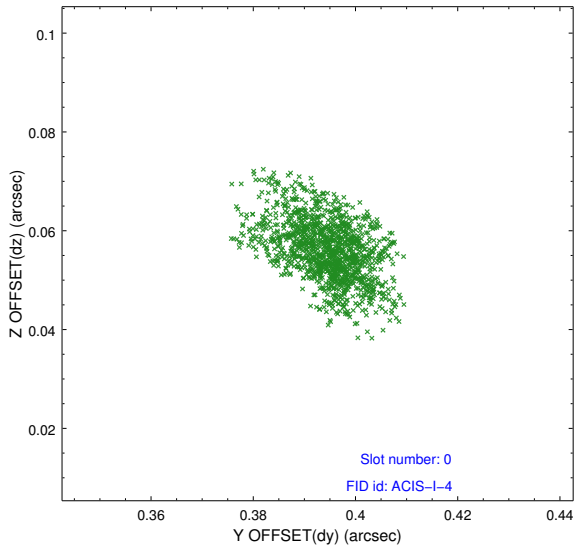

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 140001520

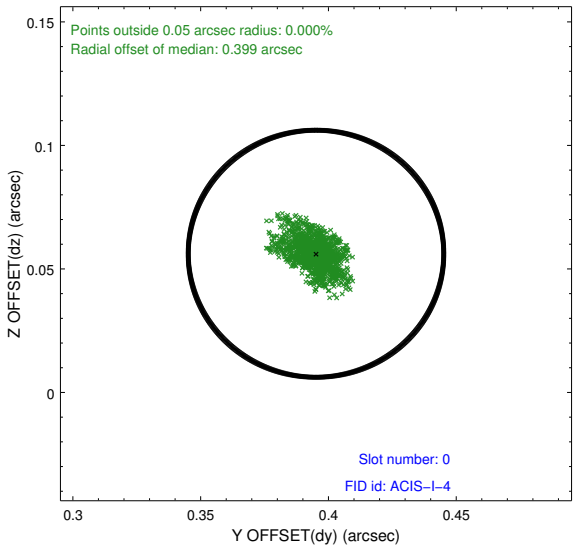

Points outside 0.7 arcsec radius: 0.040%
Radial offset of median: 0.167 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 140001520

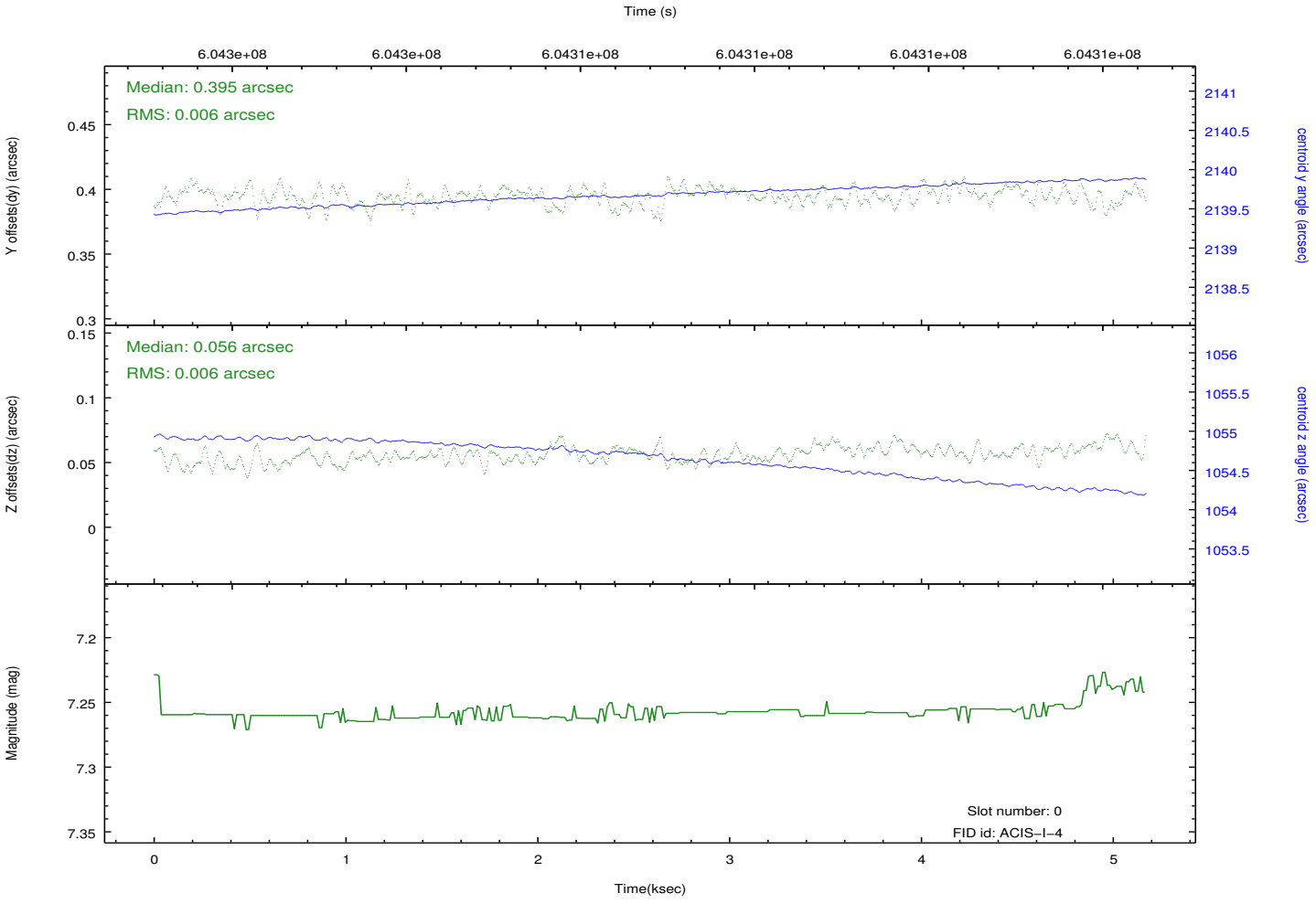

Time (s)
Median: 0.157 arcsec
RMS: 0.145 arcsec
Y offsets(dy) (arcsec)
Median: 0.058 arcsec
RMS: 0.141 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 140001520
Time(ksec)

2.5 FID Slots

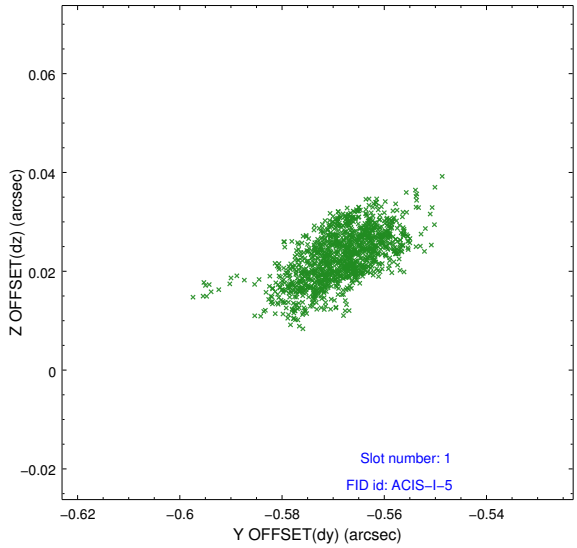
2.5.1 Slot 0

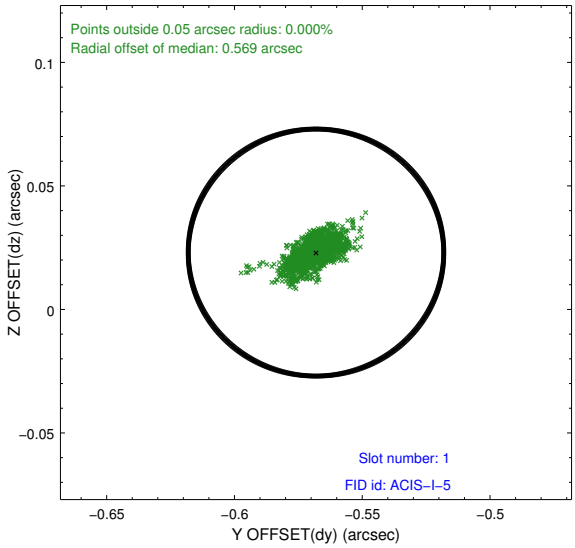


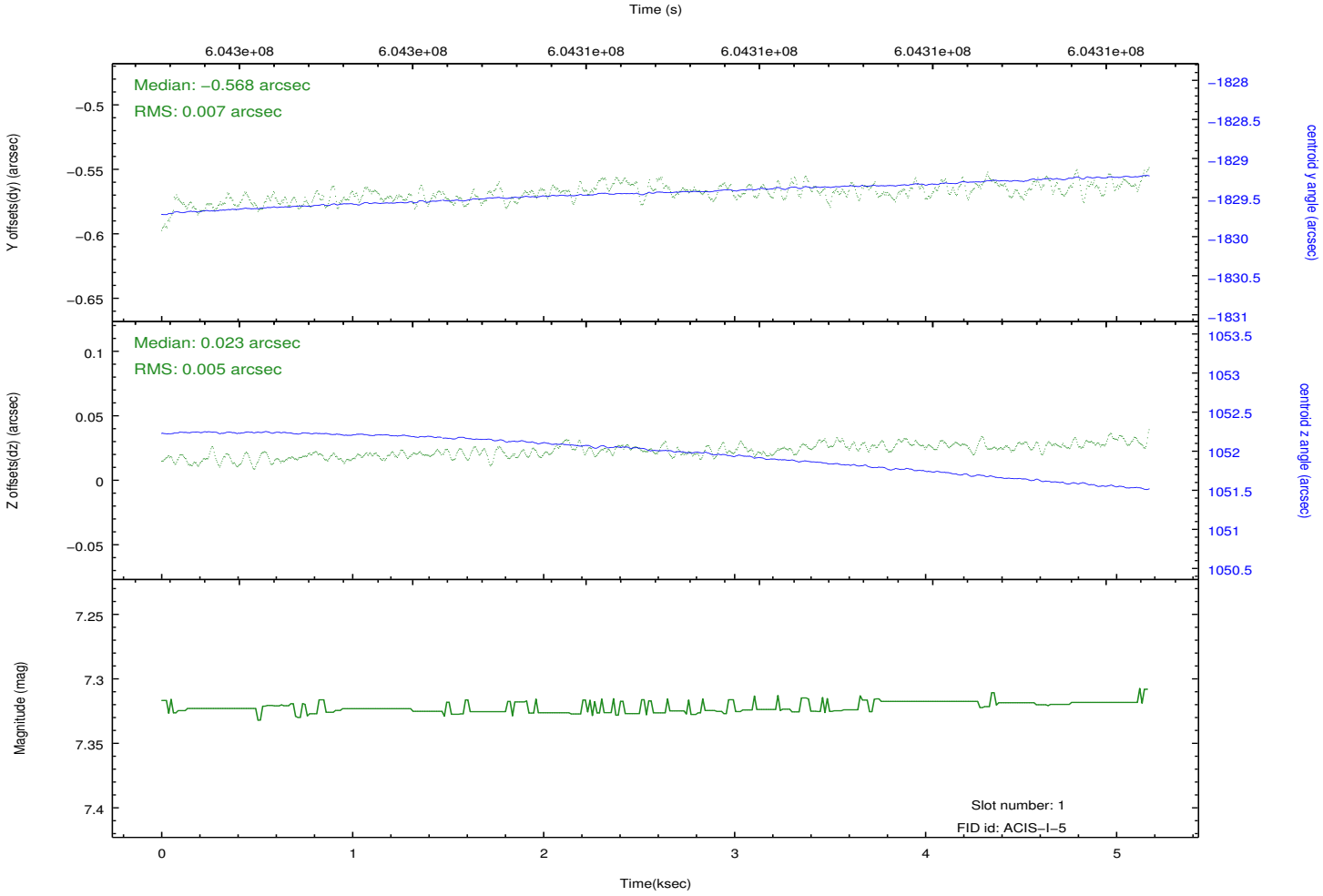




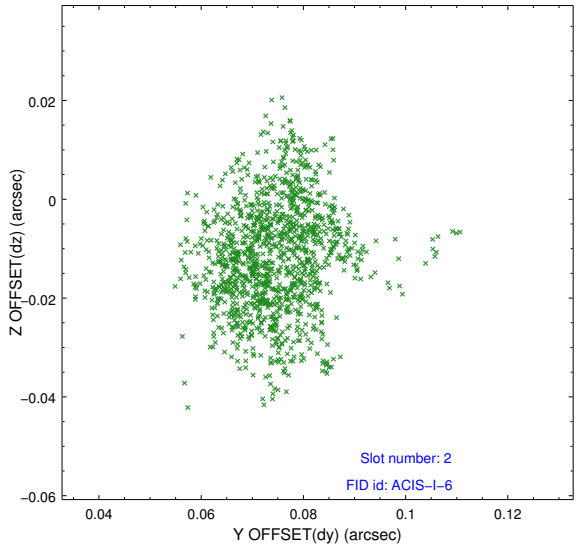
2.5.2 Slot 1

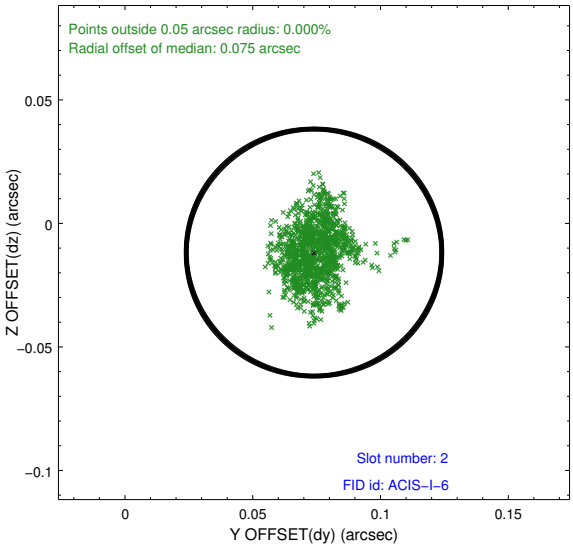

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS–I–5

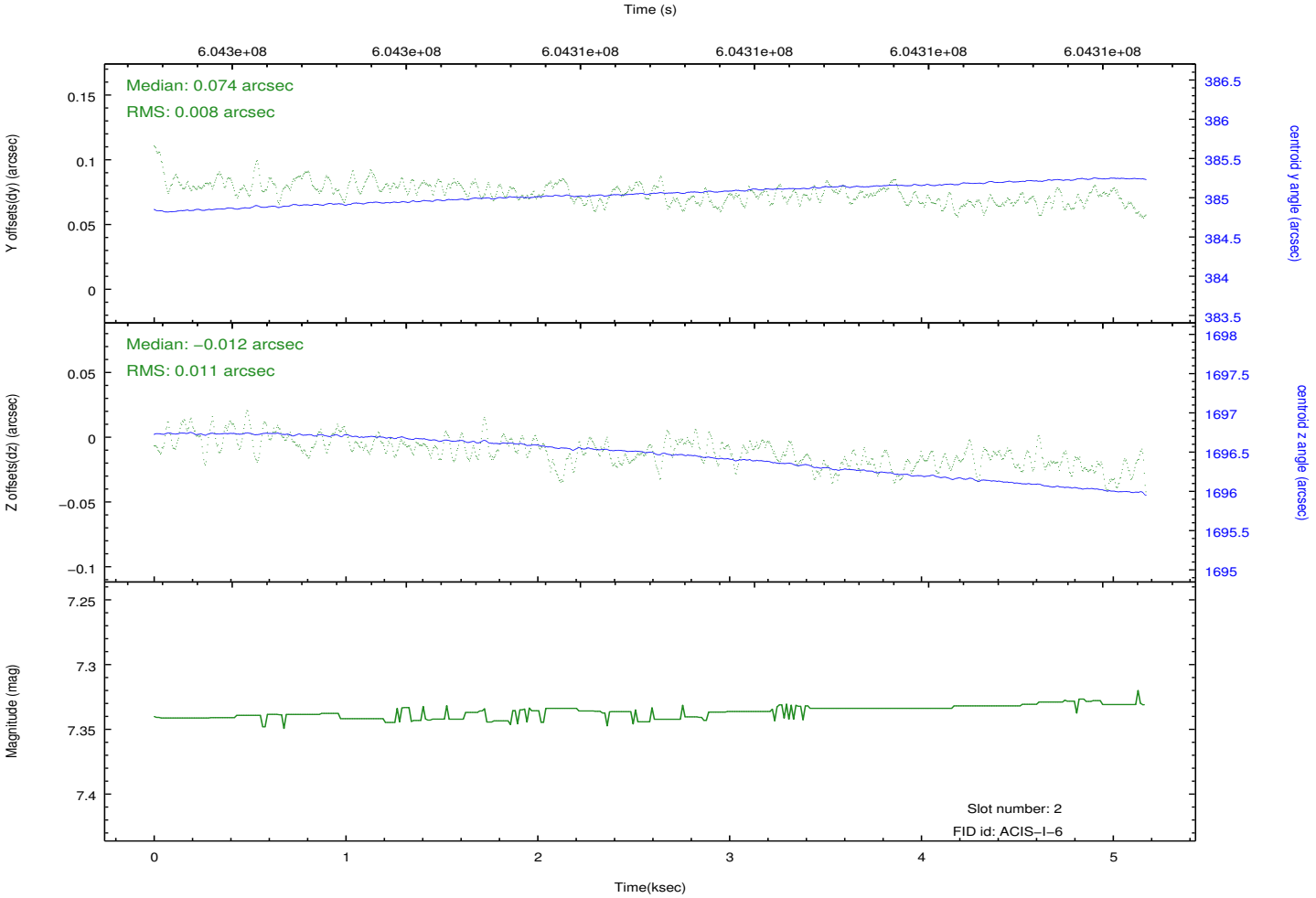

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.569 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS–I–5


Time (s)
Median: –0.568 arcsec
RMS: 0.007 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.023 arcsec
RMS: 0.005 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 1
FID id: ACIS–I–5
Time(ksec)

2.5.3 Slot 2


Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS–I–6


Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.075 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS–I–6


Time (s)
Median: 0.074 arcsec
RMS: 0.008 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: –0.012 arcsec
RMS: 0.011 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 2
FID id: ACIS–I–6
Time(ksec)

A Summary

A.1 Status

V&V Scientist	Beth Sundheim
V&V Date (YYYY-MM-DD)	2018.03.07
V&V Edition	2
V&V Disposition and Status	OK
V&V Charge Time	4.9408000736237

A.2 Comments

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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/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.
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