V&V Reference Report
L2 ASCDS Version : 10.1.1

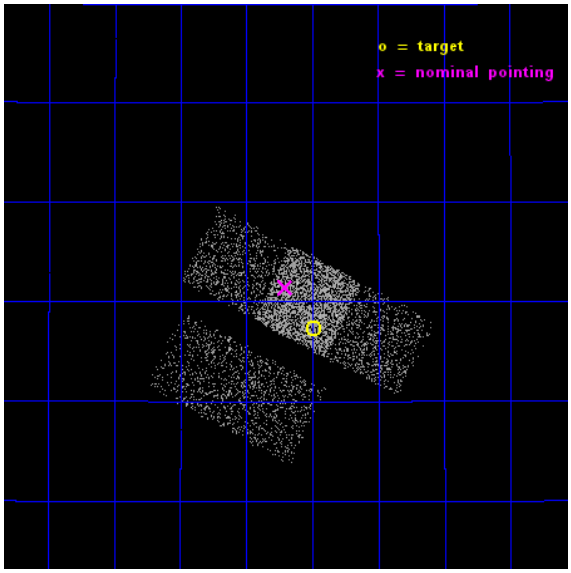
Observation 16546 - L2 Version 3
Chandra X-Ray Center

L2 Processing Date : Dec 8 2014

Contents

1 Front

seq_num	100142	Sequence number
obs_id	16546	Observation id
title	Plumbing the Heights of the Solar Wind With Comet ISON	Proposal ti
observer	Dr. Carey Lisse	Principal investigator
object	Comet C/2012 S1 (ISON)	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	242.99676	Observer's specified target RA [deg]
dec_targ	22.95453	Observer's specified target Dec [deg]
ra_nom	243.05096378508	Nominal RA [deg]
dec_nom	23.023757858265	Nominal Dec [deg]
roll_nom	27.097993348614	Nominal Roll [deg]
revision	3	Processing version of data
ontime	2356.0000181198	Sum of GTIs [s]
livetime	2325.2171434211	Livetime [s]
ontime2	2356.0000181198	Sum of GTIs [s]
ontime3	2356.0000181198	Sum of GTIs [s]
ontime6	2356.0000181198	Sum of GTIs [s]
ontime7	2356.0000181198	Sum of GTIs [s]
ontime8	2356.0000181198	Sum of GTIs [s]
l2events	6970	Number of level 2 events

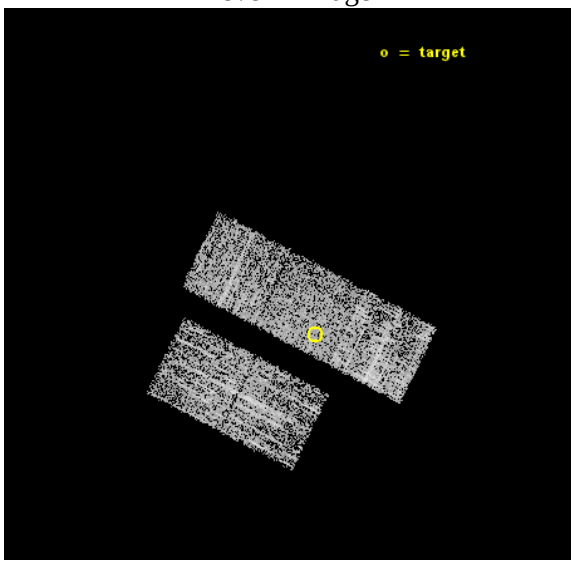


2 OBI

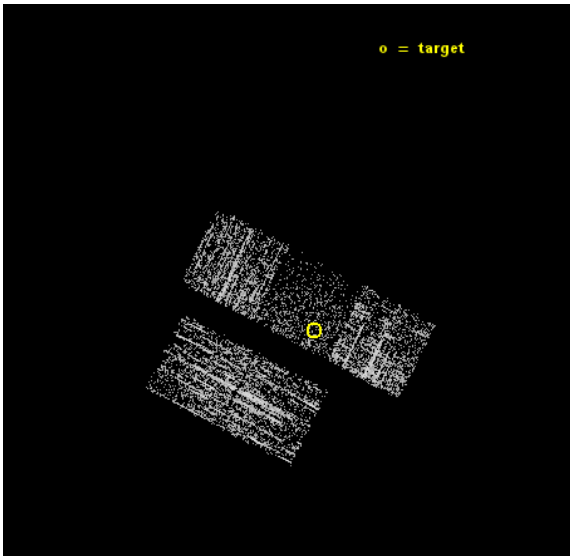
2.1 OBI

2.1.1 Images

Level 1 Image

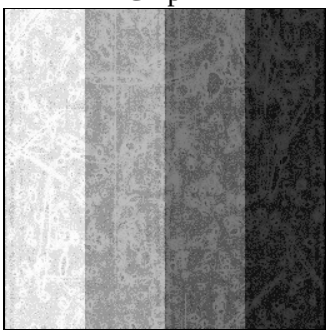


Level 1 Bad Events

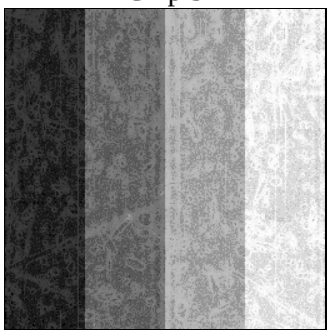


2.1.2 Bias

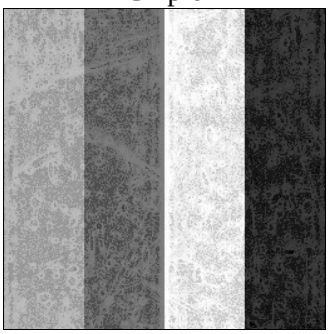
Chip 2



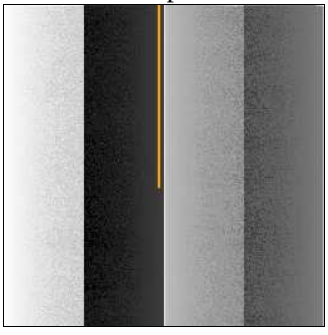
Chip 3



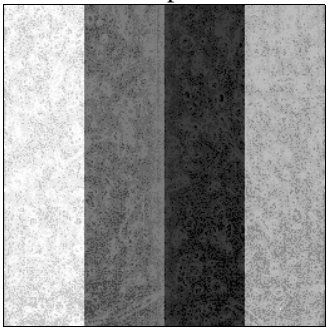
Chip 6



Chip 7



Chip 8



2.1.3 Parameters

obi_num	0	Obi number
ascdsver	10.3.1	Processing system revision
caldbver	4.6.4	
date	2014-12-08T09:57:57	Date and time of file creation
revision	3	Processing version of data

sched_exp_time	2180.000000	[s] Scheduled observation exposure time
ontime	2356.0000181198	Sum of GTIs [s]
ontime2	2356.0000181198	Sum of GTIs [s]
ontime3	2356.0000181198	Sum of GTIs [s]
ontime6	2356.0000181198	Sum of GTIs [s]
ontime7	2356.0000181198	Sum of GTIs [s]
ontime8	2356.0000181198	Sum of GTIs [s]
l1events	46264	Number of level 1 events

2.1.4 Events

	ccd 2	**ccd 3**	**ccd 6**	**ccd 7**	**ccd 8**
level 1 events	8928	9357	8668	7517	11794
rejected events	8049	8483	7665	3714	8418
rejected %	90%	90%	88%	49%	71%

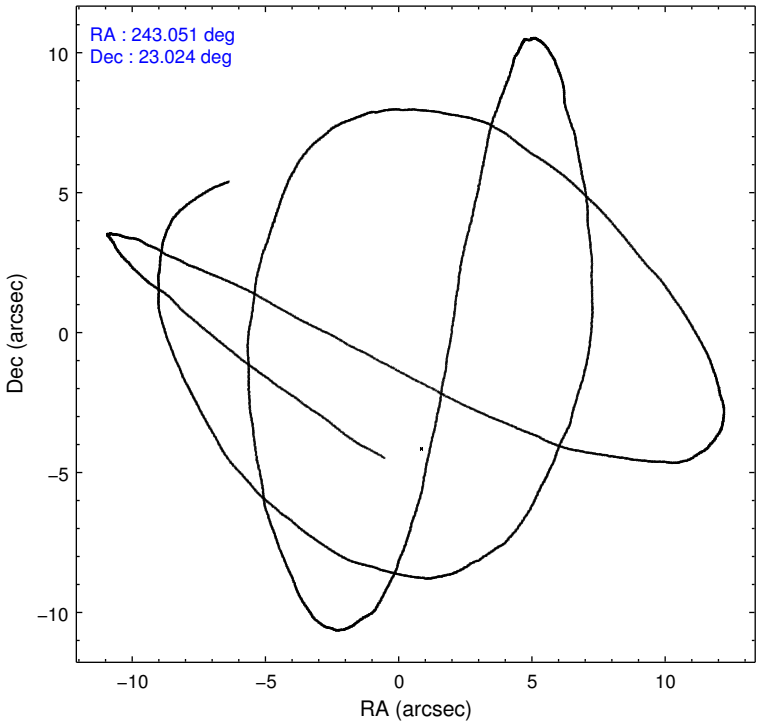
	ccd 2	**ccd 3**	**ccd 6**	**ccd 7**	**ccd 8**
grade 0 events	433	380	438	548	1037
	4%	4%	5%	7%	8%
grade 1 events	5	4	7	11	4
	0%	0%	0%	0%	0%
grade 2 events	211	220	249	953	915
	2%	2%	2%	12%	7%
grade 3 events	89	95	109	408	351
	0%	1%	1%	5%	2%
grade 4 events	77	103	110	383	358
	0%	1%	1%	5%	3%
grade 5 events	197	272	281	833	472
	2%	2%	3%	11%	4%
grade 6 events	142	156	177	1838	985
	1%	1%	2%	24%	8%
grade 7 events	7774	8127	7297	2543	7672
	87%	86%	84%	33%	65%

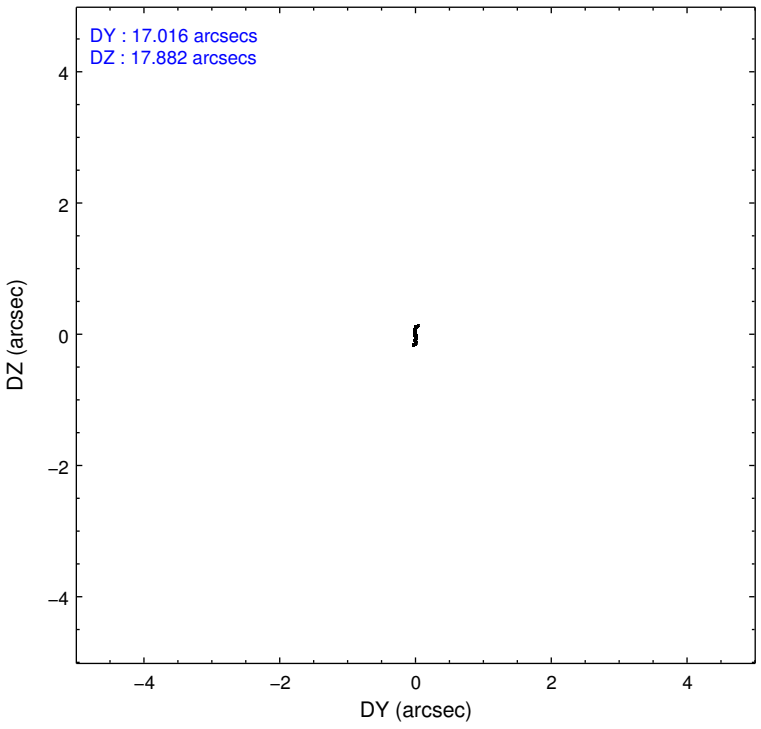
2.2 Compared Parameters

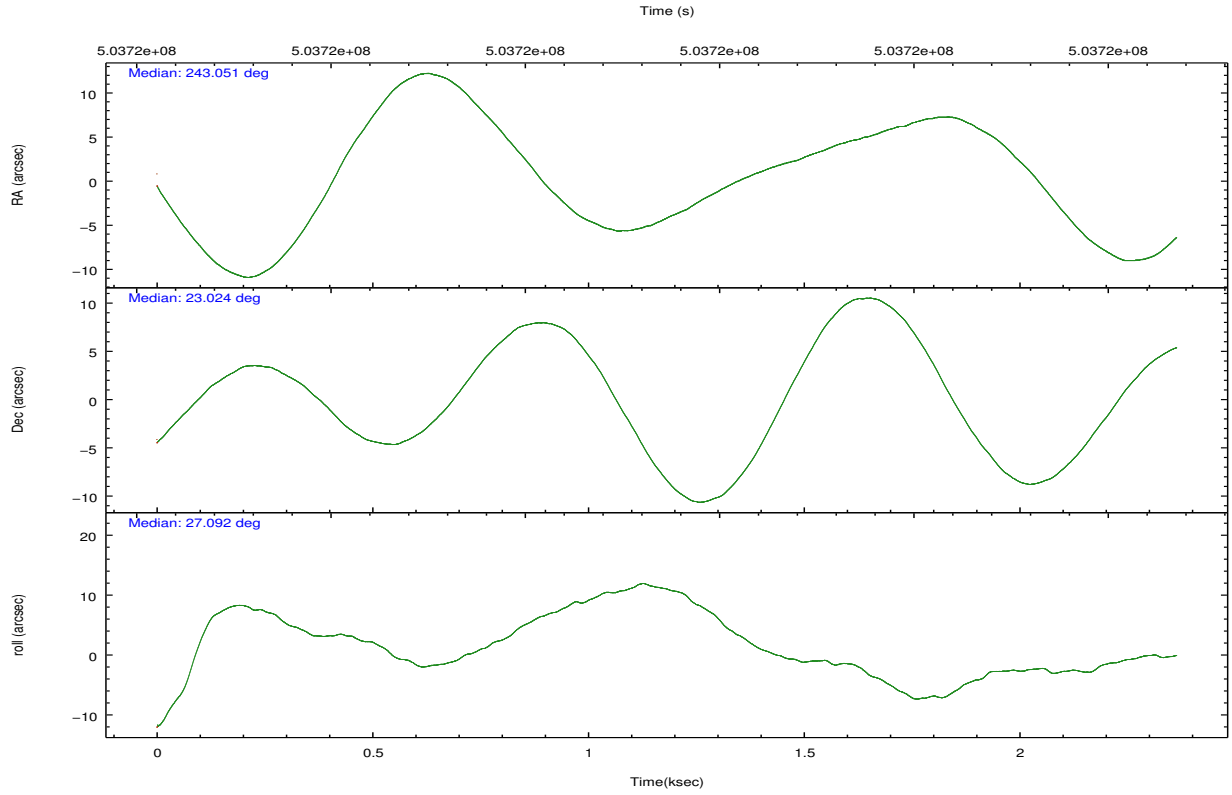
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-23678	ACIS-23678
Grating	NONE	NONE
Data mode	VFAINT	VFAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	243.035486	243.0509637850838
[deg] Pointing Dec	23.000620	23.02375785826474
[deg] Pointing Roll	26.947447	27.09799334861393
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-190.132523	-190.1425803651734
[mm] SIM translation stage offset	0	0.01005778216563158
[s] Observation start time (MET)	503715864.184000	503715487.44027
Observation start date	2013-12-18T01:03:17	2013-12-18T00:58:07
[s] Observation end time (MET)	503718044.184000	503719223.56547
Observation end date	2013-12-18T01:39:37	2013-12-18T02:00:23
Read mode	TIMED	TIMED

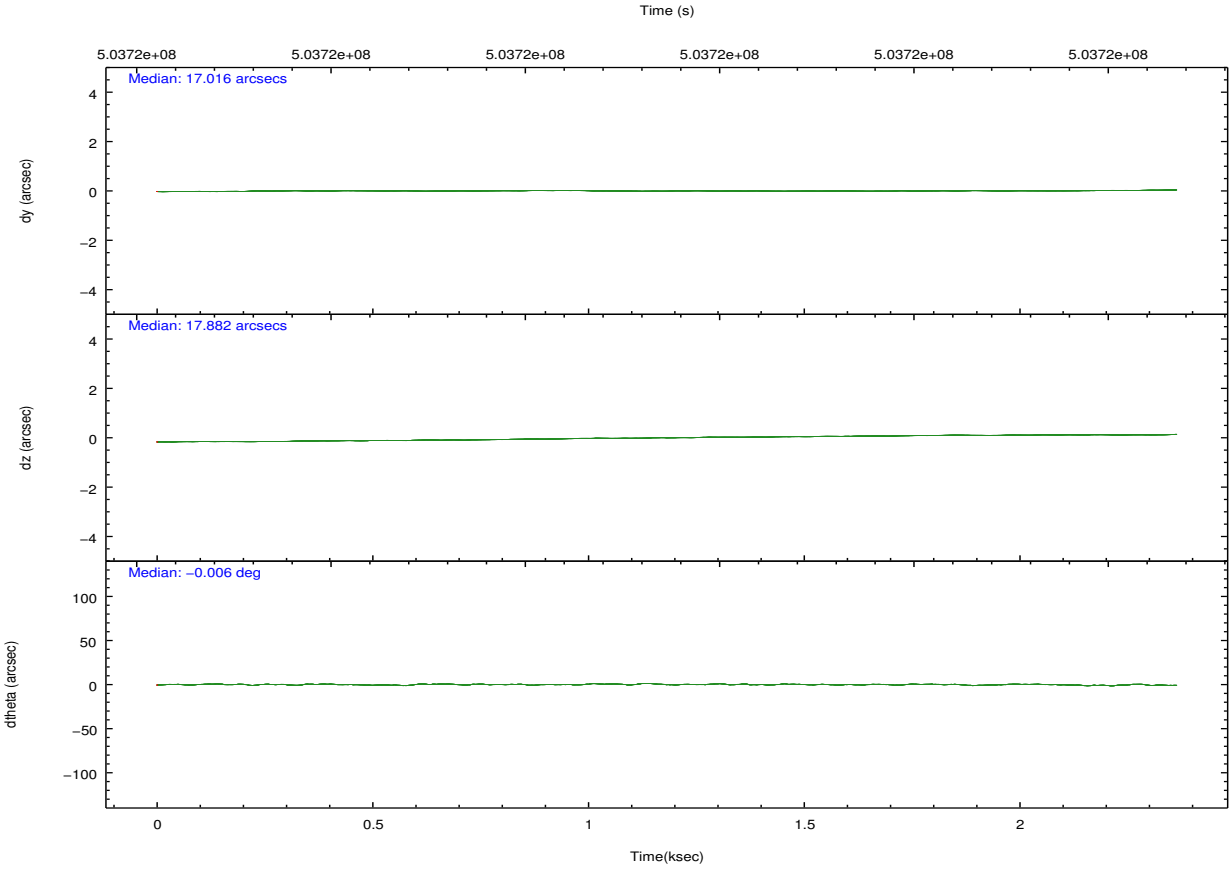
Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
CCD I0 on	N	N
CCD I1 on	N	N
CCD I2 on	Y	Y
CCD I3 on	Y	Y
CCD S0 on	N	N
CCD S1 on	N	N
CCD S2 on	Y	Y
CCD S3 on	Y	Y
CCD S4 on	O1	Y
CCD S5 on	N	N
Number of optional ACIS chips dropped	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 : 243.051 deg
Dec : 23.024 deg
Dec (arcsec)
RA (arcsec)
10
5
0
−5
−10
−10
−5
0
5
10


DY : 17.016 arcsecs
DZ : 17.882 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−4
−2
0
2
4


Time (s)
5.0372e+08
5.0372e+08
5.0372e+08
5.0372e+08
5.0372e+08
5.0372e+08
Median: 243.051 deg
RA (arcsec)
Median: 23.024 deg
Dec (arcsec)
Median: 27.092 deg
roll (arcsec)
Time(ksec)

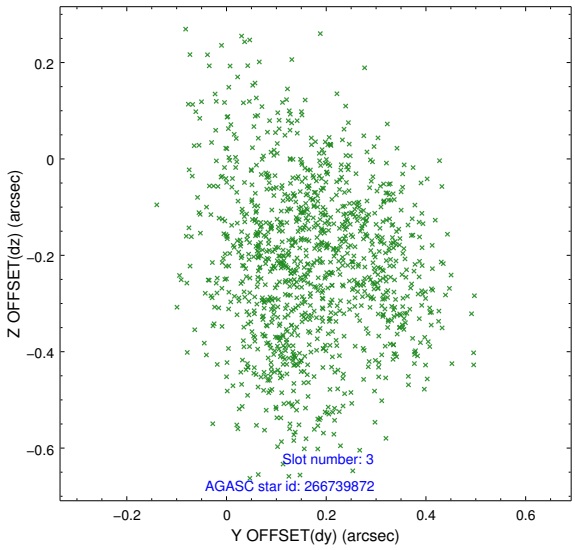

Time (s)
5.0372e+08
5.0372e+08
5.0372e+08
5.0372e+08
5.0372e+08
5.0372e+08
Median: 17.016 arcsecs
dy (arcsec)
Median: 17.882 arcsecs
dz (arcsec)
Median: −0.006 deg
dtheta (arcsec)
Time(ksec)

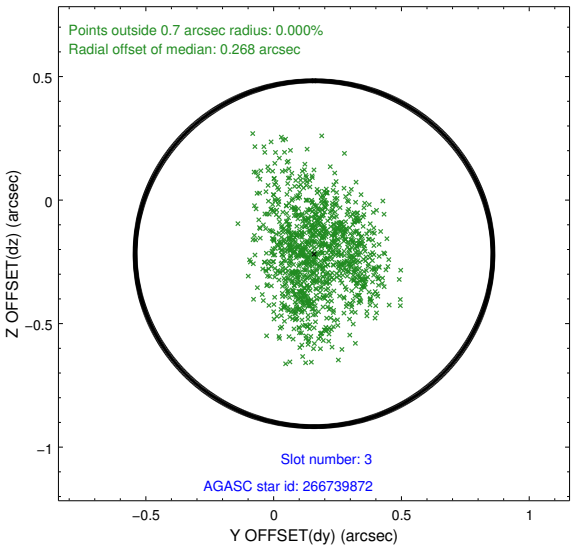
Slot Statistics

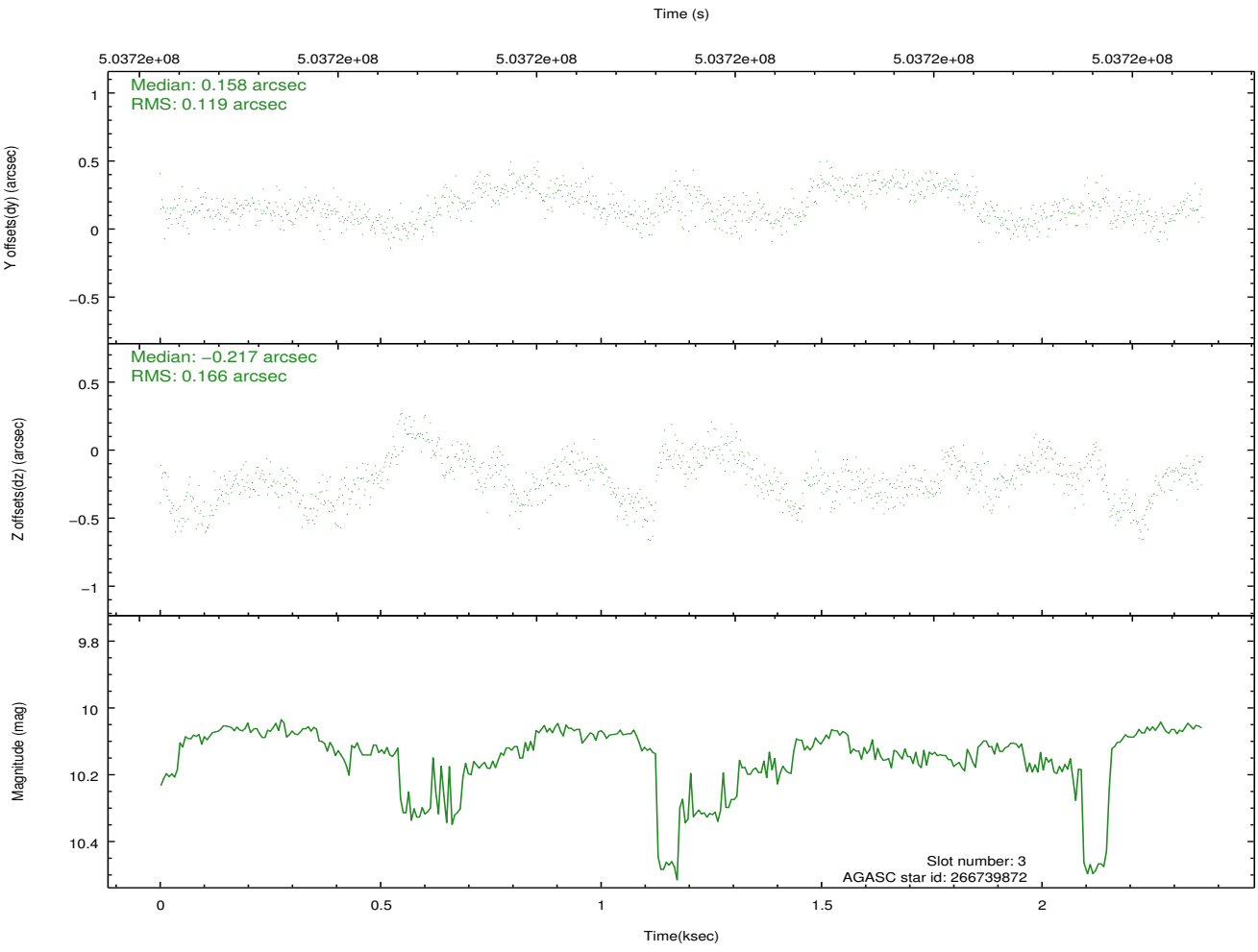
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-S-1	7.04	577	0.169	-0.046	0.007	0.011	0.000000	0.000000	926.18	-1734.94
1	FID		ACIS-S-2	6.95	577	-0.106	-0.014	0.008	0.014	0.000000	0.000000	-768.48	-1742.32
2	FID		ACIS-S-5	7.07	577	-0.087	0.067	0.007	0.011	0.000000	0.000000	-1824.50	159.84
3	GUIDE	used	266739872	10.13	1152	0.158	-0.217	0.219	0.354	242.618751	23.258533	-805.78	1453.57
4	GUIDE	used	267649720	10.10	1154	-0.069	0.284	0.211	0.345	243.630637	22.541094	1016.90	-2366.45
5	GUIDE	used	267656376	9.52	1154	-0.144	0.073	0.164	0.245	243.531660	23.133028	1683.55	-318.98
6	GUIDE	used	267657264	9.53	1152	-0.118	-0.379	0.239	0.371	242.916912	23.614200	654.24	2145.03
7	GUIDE	used	267653416	10.15	1150	0.195	0.256	0.197	0.328	242.820593	22.538785	-1388.09	-1156.03

2.4 Star Slots

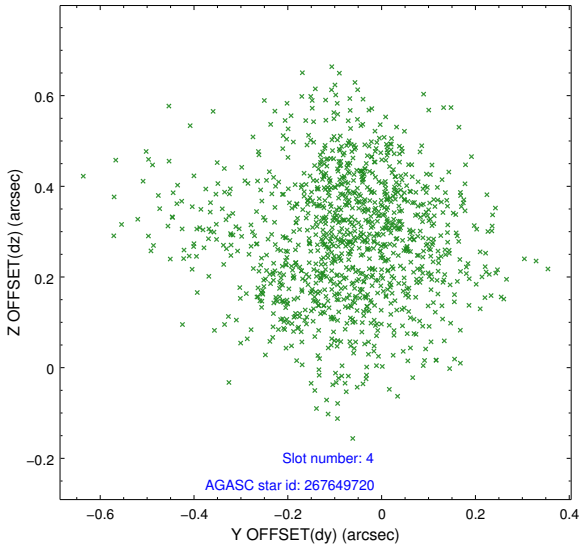
2.4.1 Slot 3

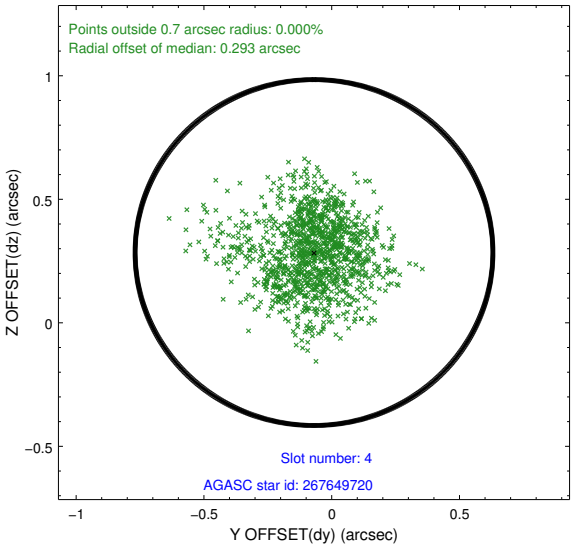


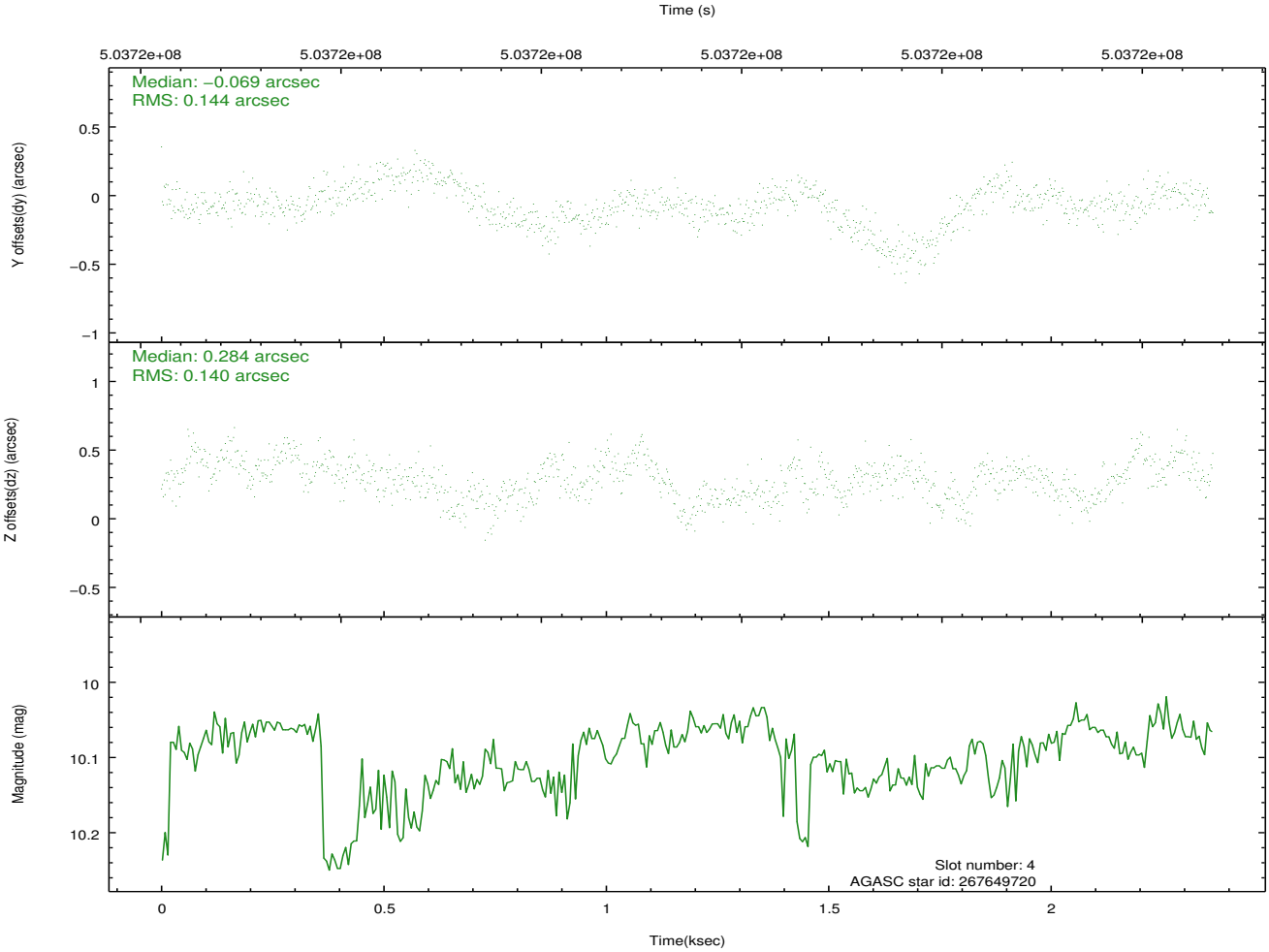




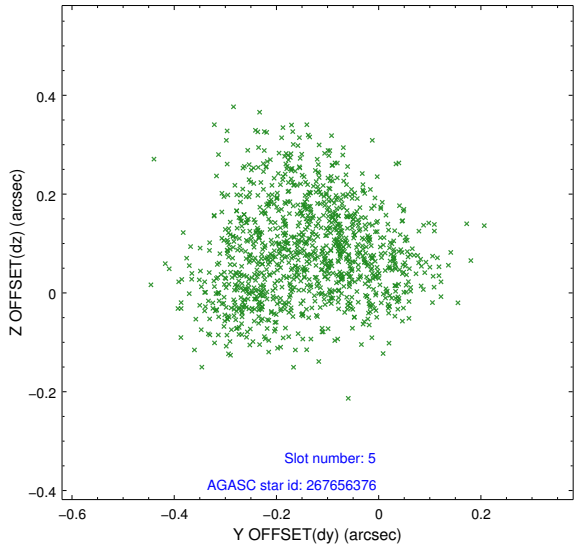
2.4.2 Slot 4

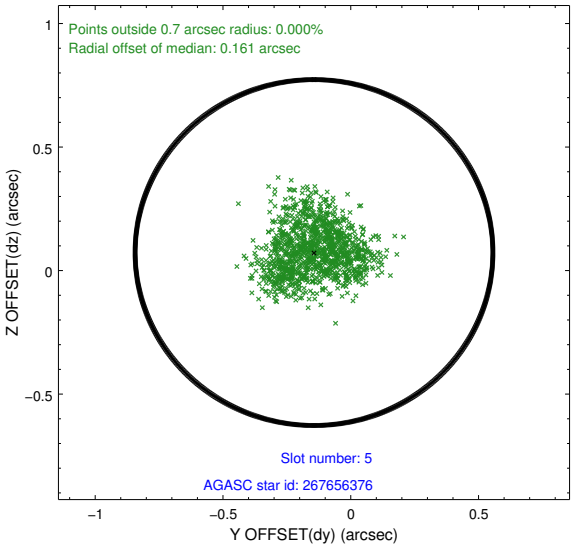

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 267649720

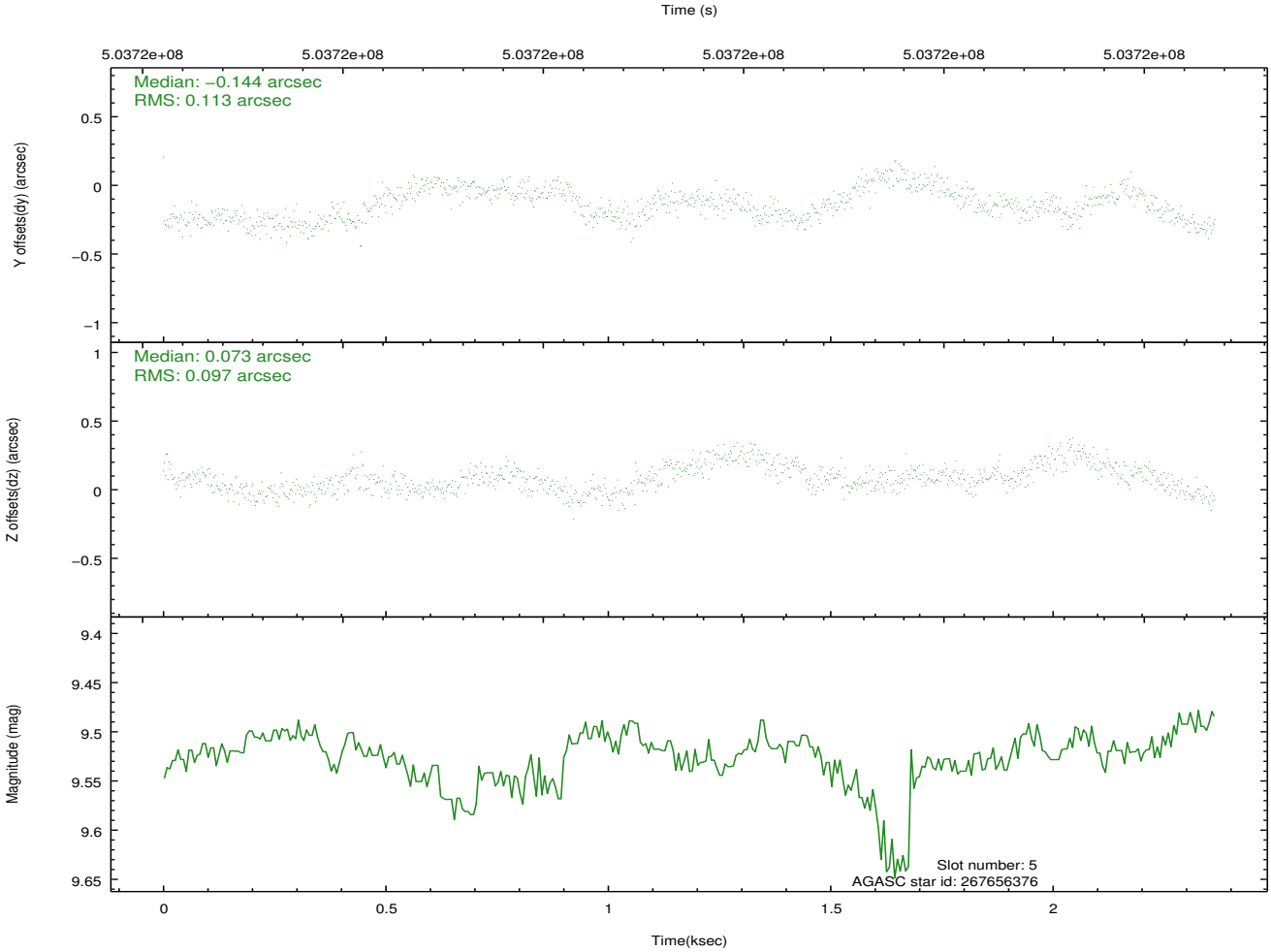

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.293 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 267649720


Time (s)
Median: −0.069 arcsec
RMS: 0.144 arcsec
Y offsets(dy) (arcsec)
Median: 0.284 arcsec
RMS: 0.140 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 267649720
Time(ksec)

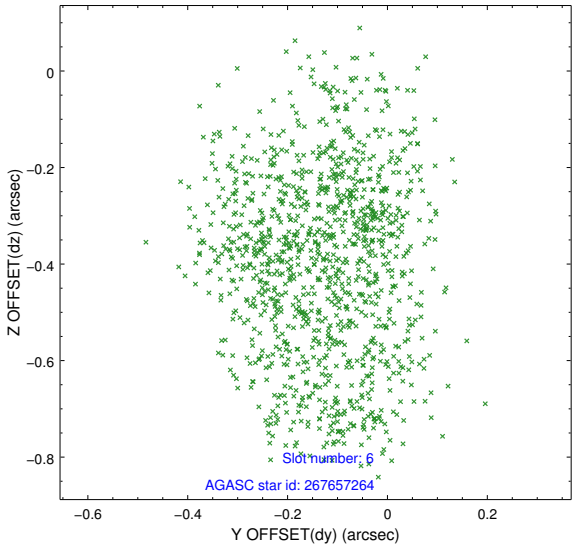
2.4.3 Slot 5

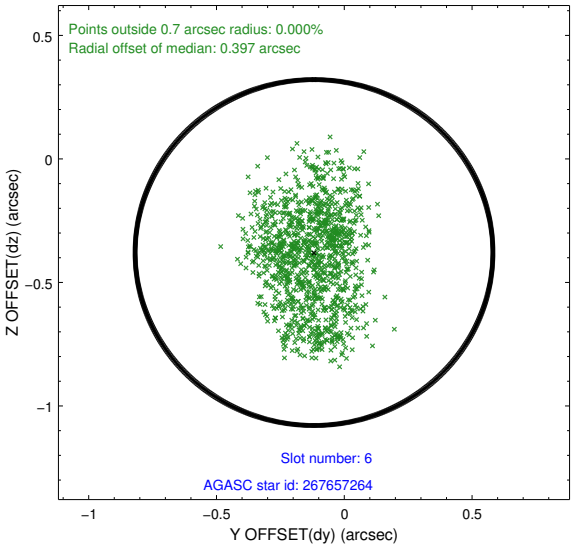

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 267656376

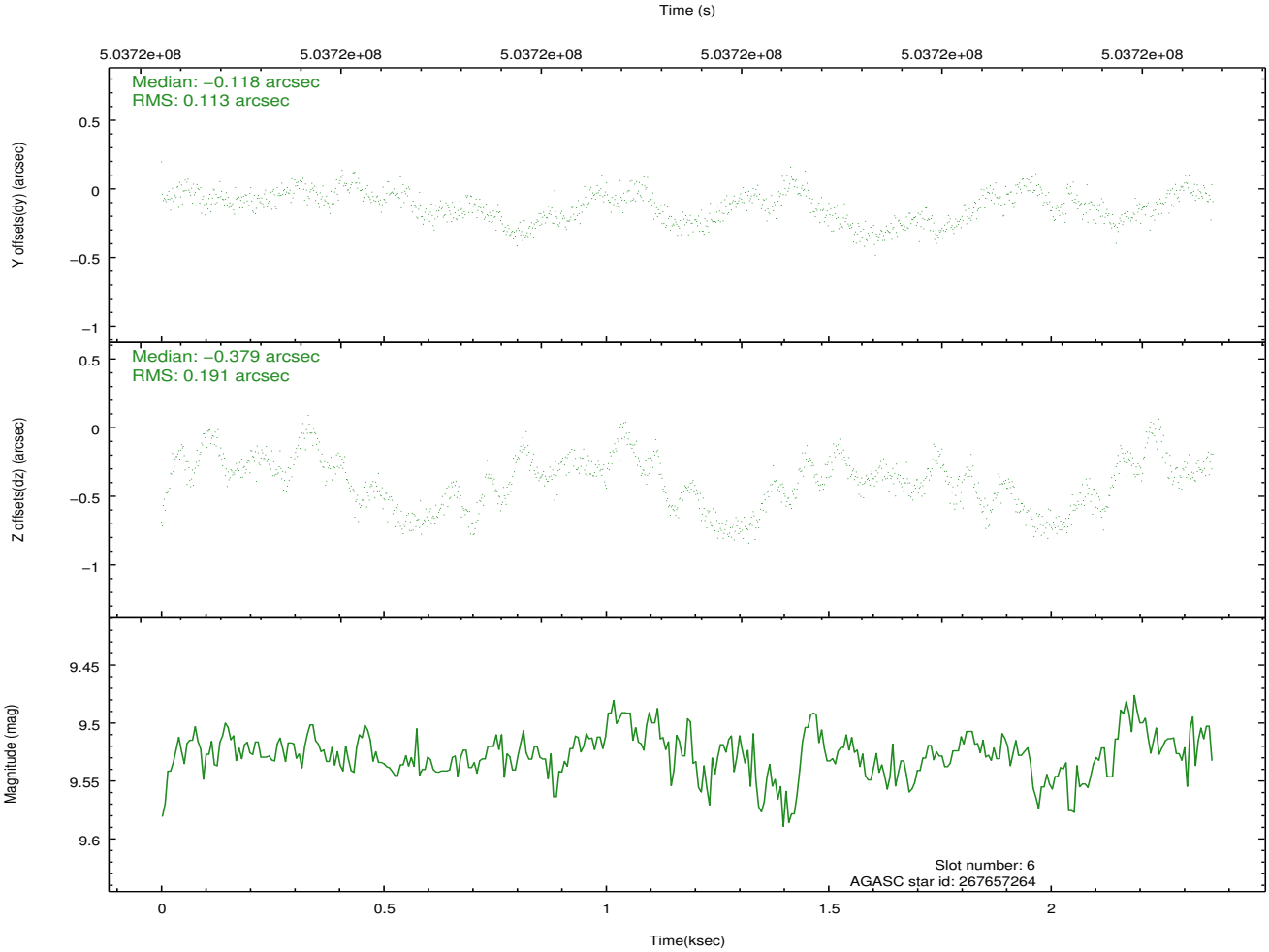

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.161 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 267656376


Time (s)
Median: −0.144 arcsec
RMS: 0.113 arcsec
Y offsets(dy) (arcsec)
Median: 0.073 arcsec
RMS: 0.097 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 267656376
Time(ksec)

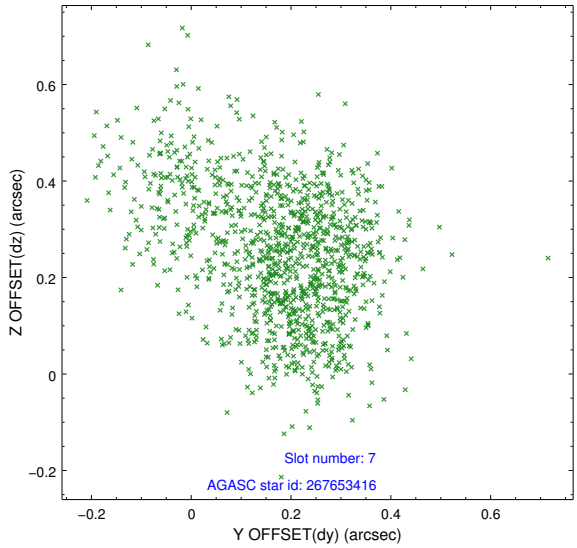
2.4.4 Slot 6

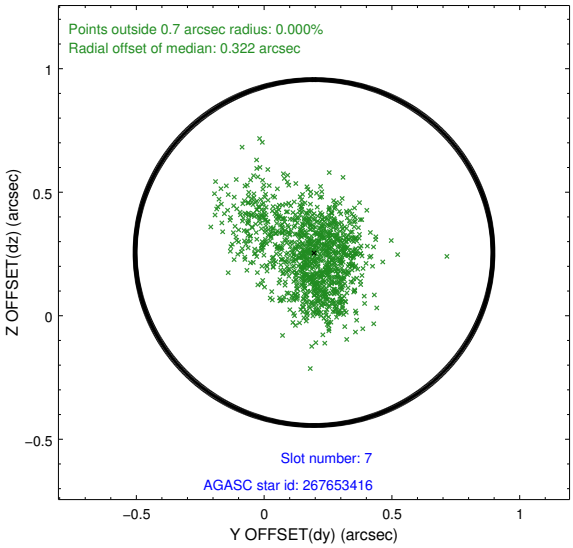

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 267657264

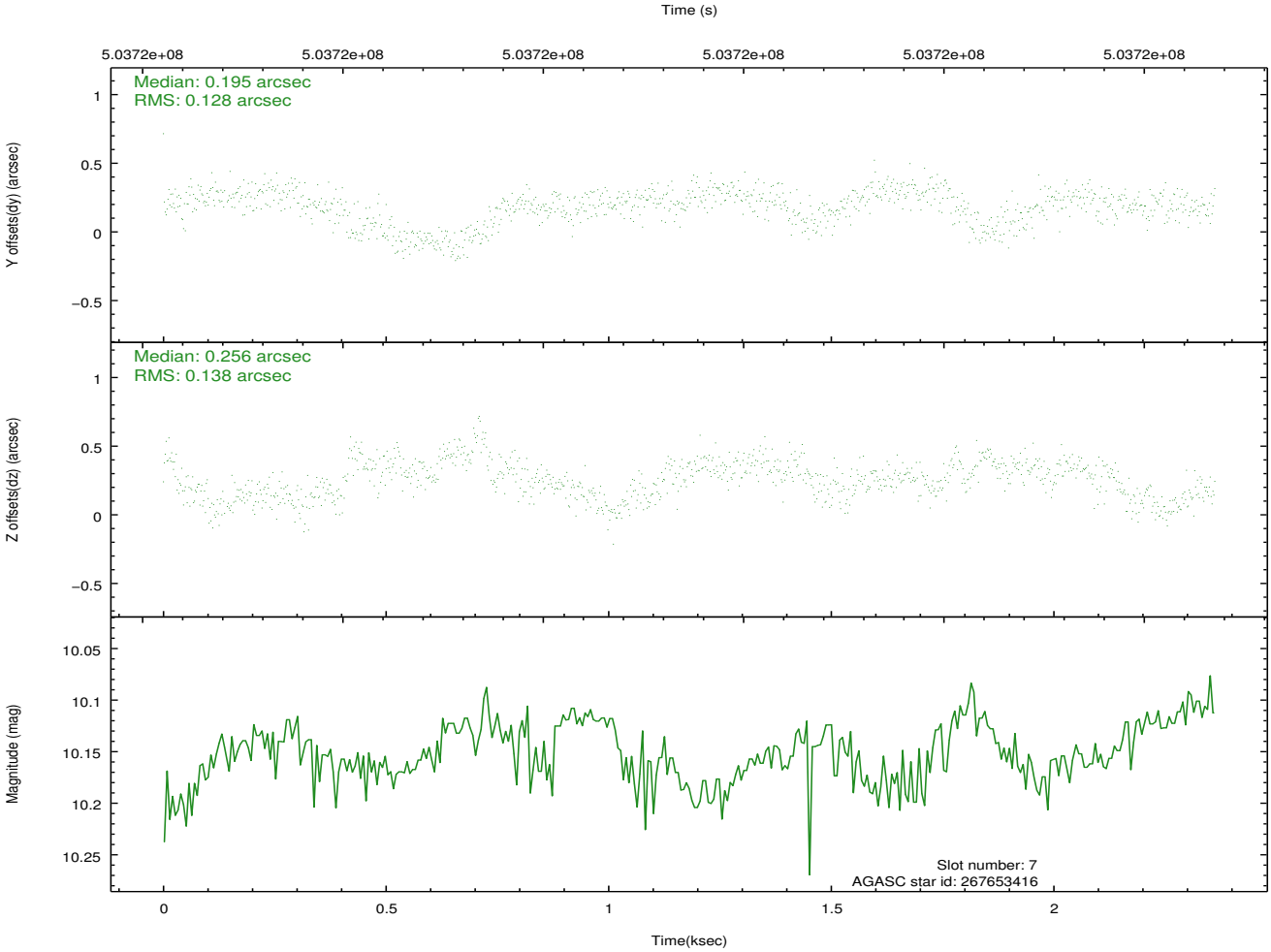

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.397 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 267657264


Time (s)
Median: −0.118 arcsec
RMS: 0.113 arcsec
Y offsets(dy) (arcsec)
Median: −0.379 arcsec
RMS: 0.191 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 267657264
Time(ksec)

2.4.5 Slot 7

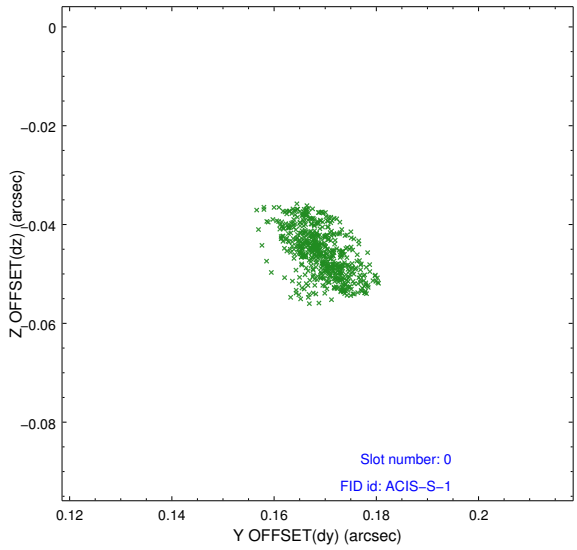

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 267653416

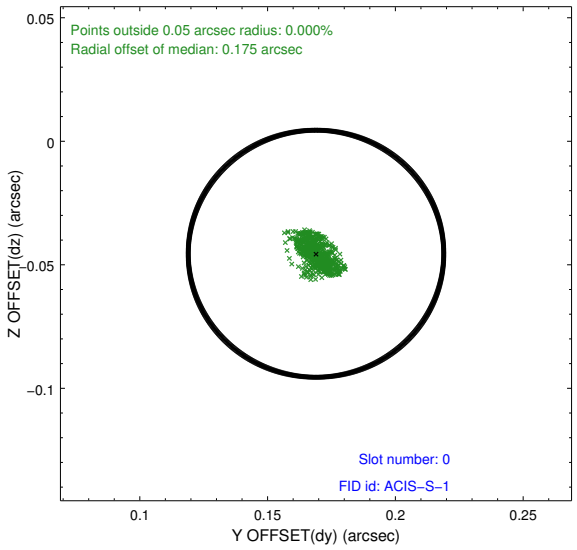

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.322 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 267653416

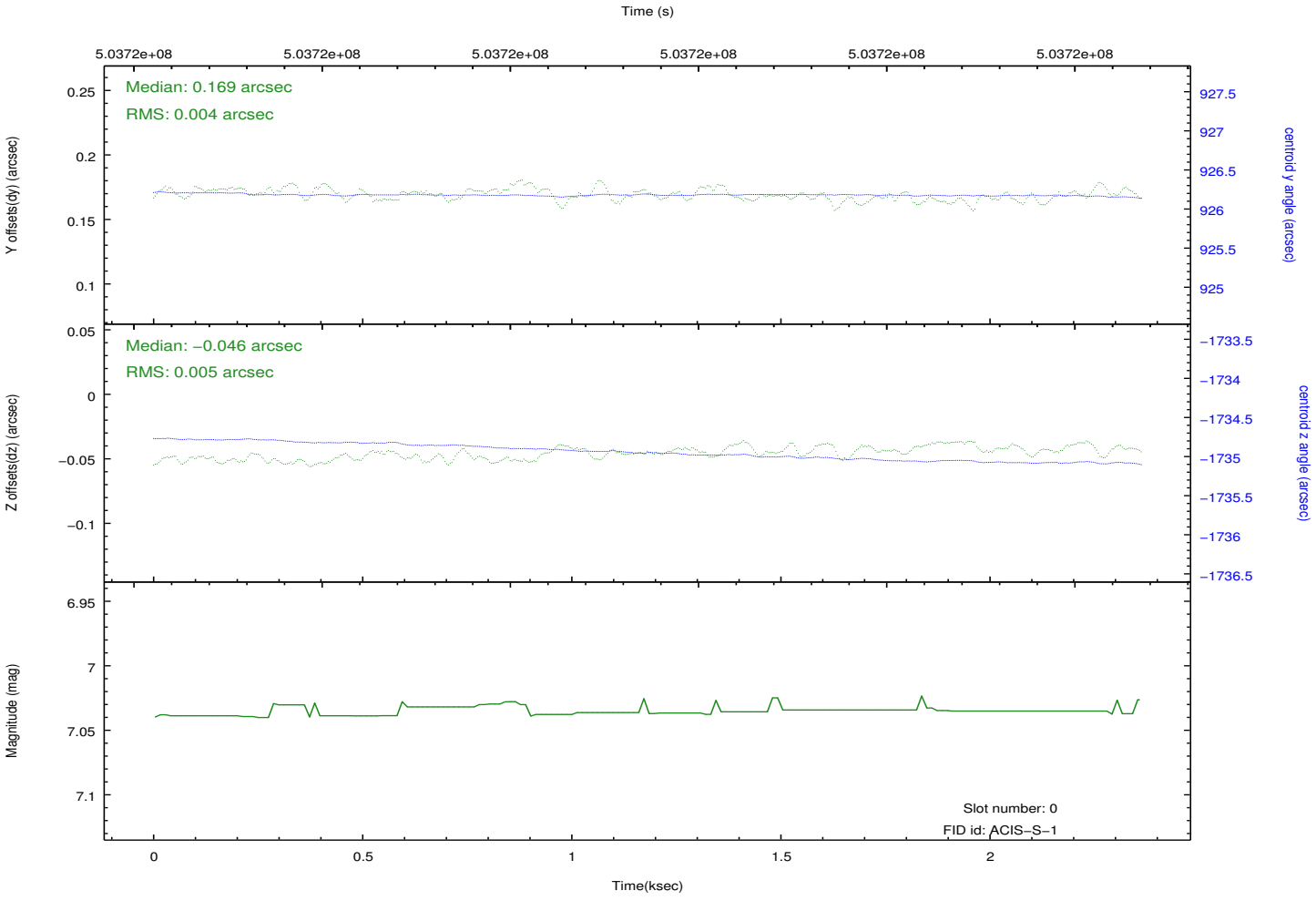

Time (s)
Median: 0.195 arcsec
RMS: 0.128 arcsec
Y offsets(dy) (arcsec)
Median: 0.256 arcsec
RMS: 0.138 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 267653416
Time(ksec)

2.5 FID Slots

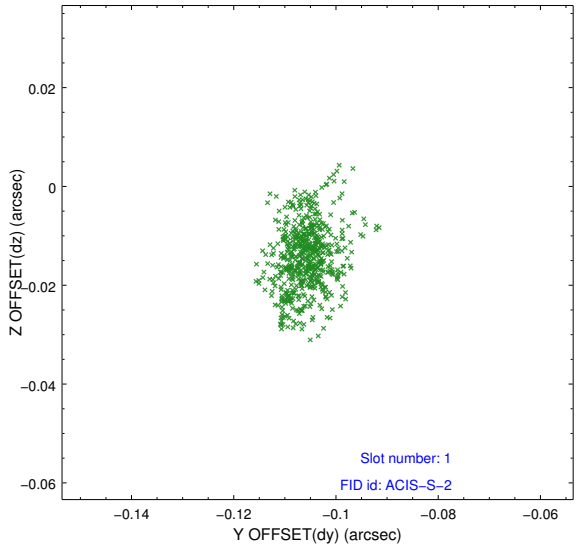
2.5.1 Slot 0

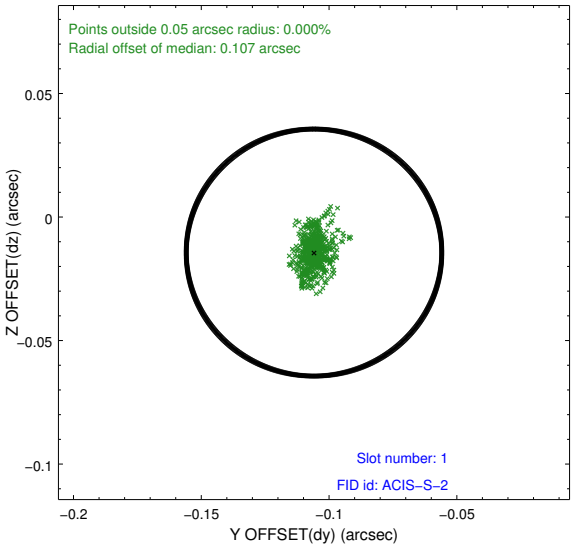


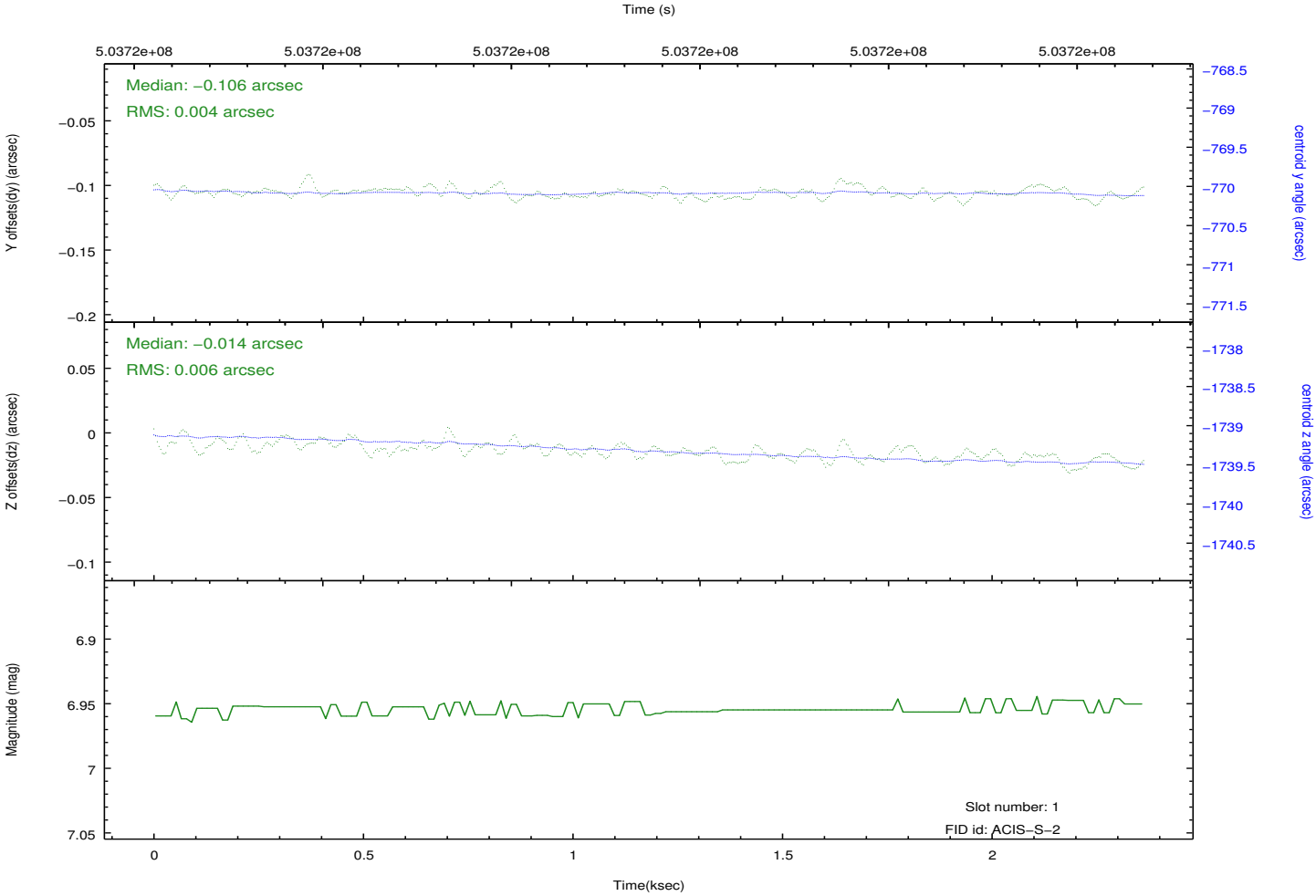




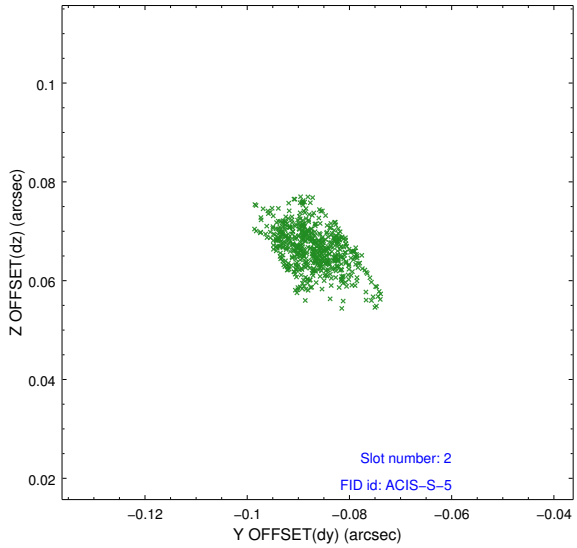
2.5.2 Slot 1

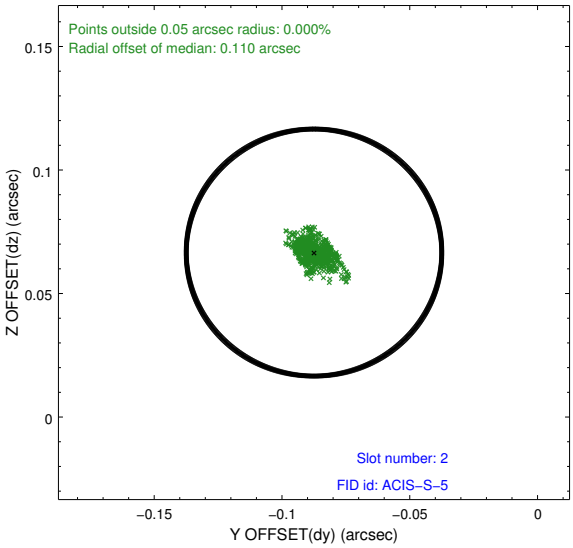

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−2

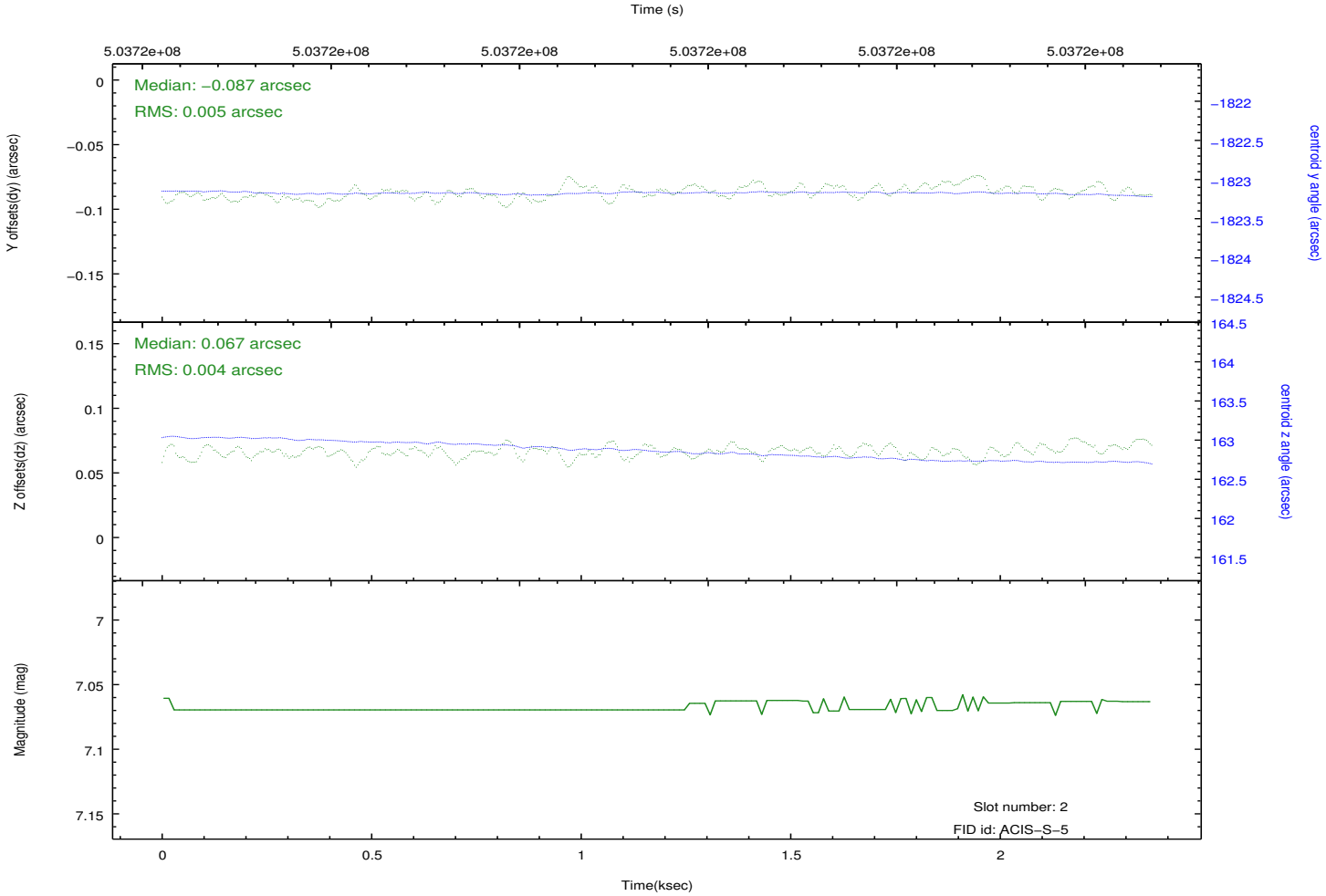

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.107 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−2


Time (s)
Median: −0.106 arcsec
RMS: 0.004 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: −0.014 arcsec
RMS: 0.006 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 1
FID id: ACIS−S−2
Time(ksec)

2.5.3 Slot 2


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


Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.110 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5


Time (s)
Median: −0.087 arcsec
RMS: 0.005 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.067 arcsec
RMS: 0.004 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 2
FID id: ACIS−S−5
Time(ksec)

A Summary

A.1 Status

V&V Scientist	Jen Lauer
V&V Date (YYYY-MM-DD)	2014.12.16
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	2.3560000181198

A.2 Comments

```
This is a moving target. Users will need to run sso_freeze or similar
software to position the events in the reference frame of the target.
=======
These data have been reprocessed with new aspect alignment calibration
files that correct small mean offsets (up to 0.4 arcsecs) and improve
overall astrometric accuracy. The new calibration was determined using
data from the time period being reprocessed and was performed using
cross-correlation of X-ray sources with radio and optical counterparts.
```