V&V Reference Report
L2 ASCDS Version : 10.0.1

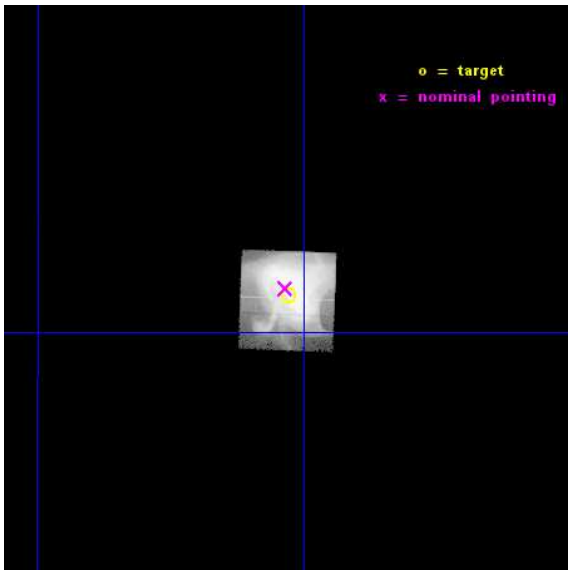
Observation 14678 - L2 Version 2
Chandra X-Ray Center

L2 Processing Date : Dec 6 2014

Contents

1 Front

seq_num	501812	Sequence number
obs_id	14678	Observation id
title	Joint Chandra and HST Monitoring and Studies of the Crab Nebula	Pr
observer	Dr. Martin Weisskopf	Principal investigator
object	Crab	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	83.631667	Observer's specified target RA [deg]
dec_targ	22.015667	Observer's specified target Dec [deg]
ra_nom	83.633295330179	Nominal RA [deg]
dec_nom	22.018507106824	Nominal Dec [deg]
roll_nom	92.16149710625	Nominal Roll [deg]
revision	2	Processing version of data
ontime	3602.6827985048	Sum of GTIs [s]
livetime	625.40061773165	Livetime [s]
ontime7	3602.6827985048	Sum of GTIs [s]
l2events	1712839	Number of level 2 events

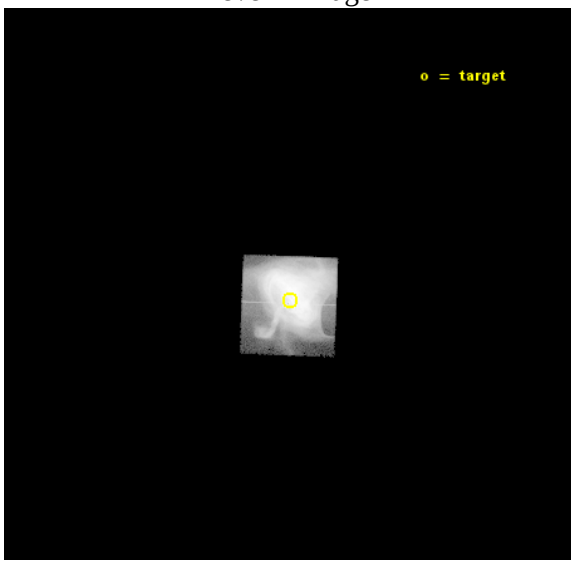


2 OBI

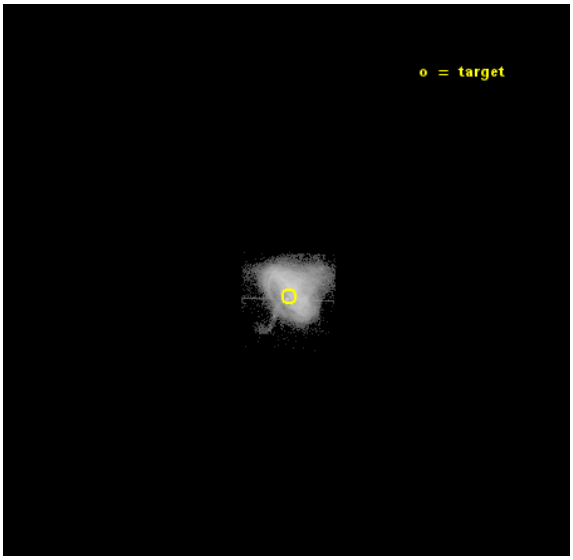
2.1 OBI

2.1.1 Images

Level 1 Image



Level 1 Bad Events



2.1.2 Parameters

obi_num	0	Obi number
ascdsver	10.3.1	Processing system revision
caldbver	4.6.4	
date	2014-12-07T02:00:57	Date and time of file creation
revision	2	Processing version of data

sched_exp_time	5000.000000	[s] Scheduled observation exposure time
ontime	3602.6827985048	Sum of GTIs [s]
ontime7	3602.6827985048	Sum of GTIs [s]
l1events	1888385	Number of level 1 events

2.1.3 Events

	ccd 7
level 1 events	1888385
rejected events	165461
rejected %	8%

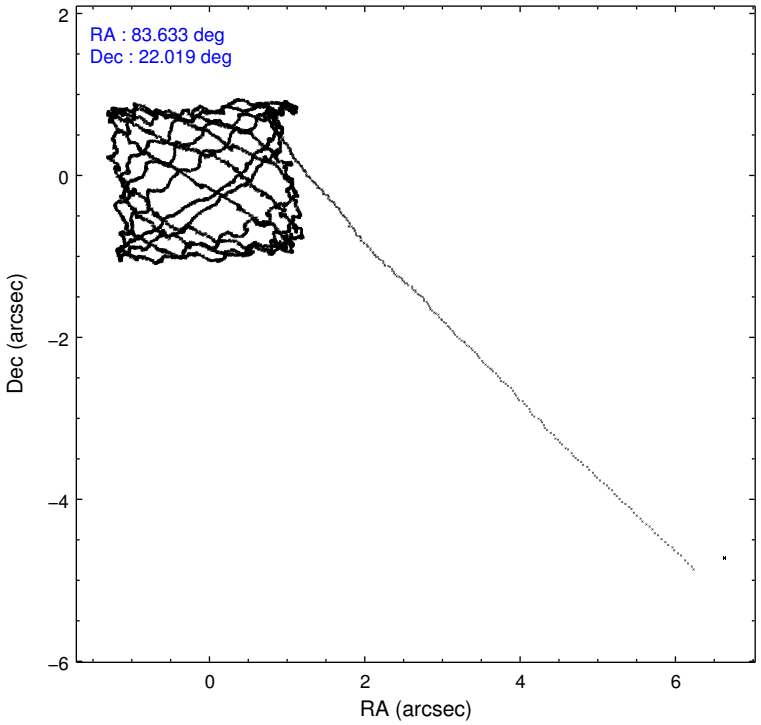
	ccd 7
grade 0 events	370349
	19%
grade 1 events	19922
	1%
grade 2 events	475434
	25%
grade 3 events	189300
	10%
grade 4 events	187046
	9%
grade 5 events	59806
	3%
grade 6 events	501324
	26%
grade 7 events	85204
	4%

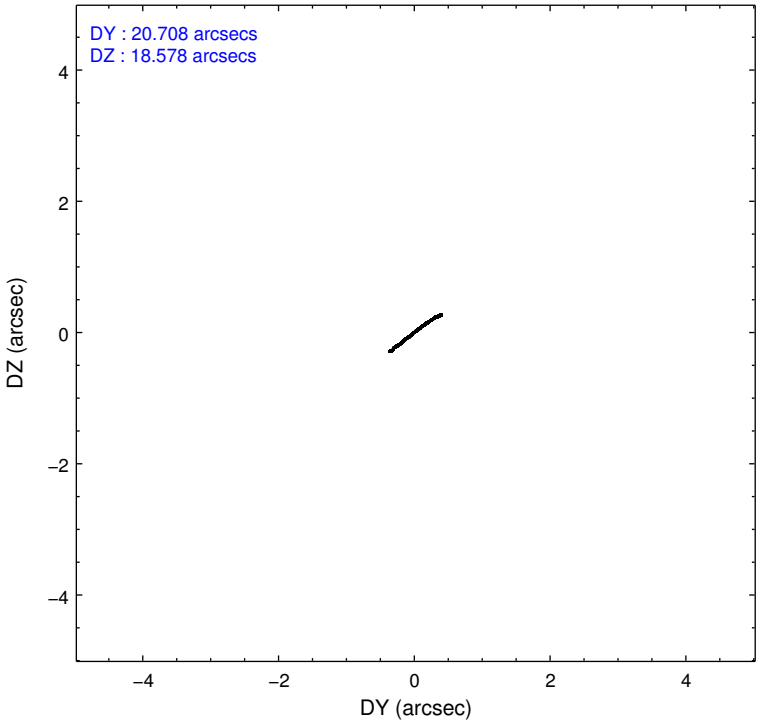
2.2 Compared Parameters

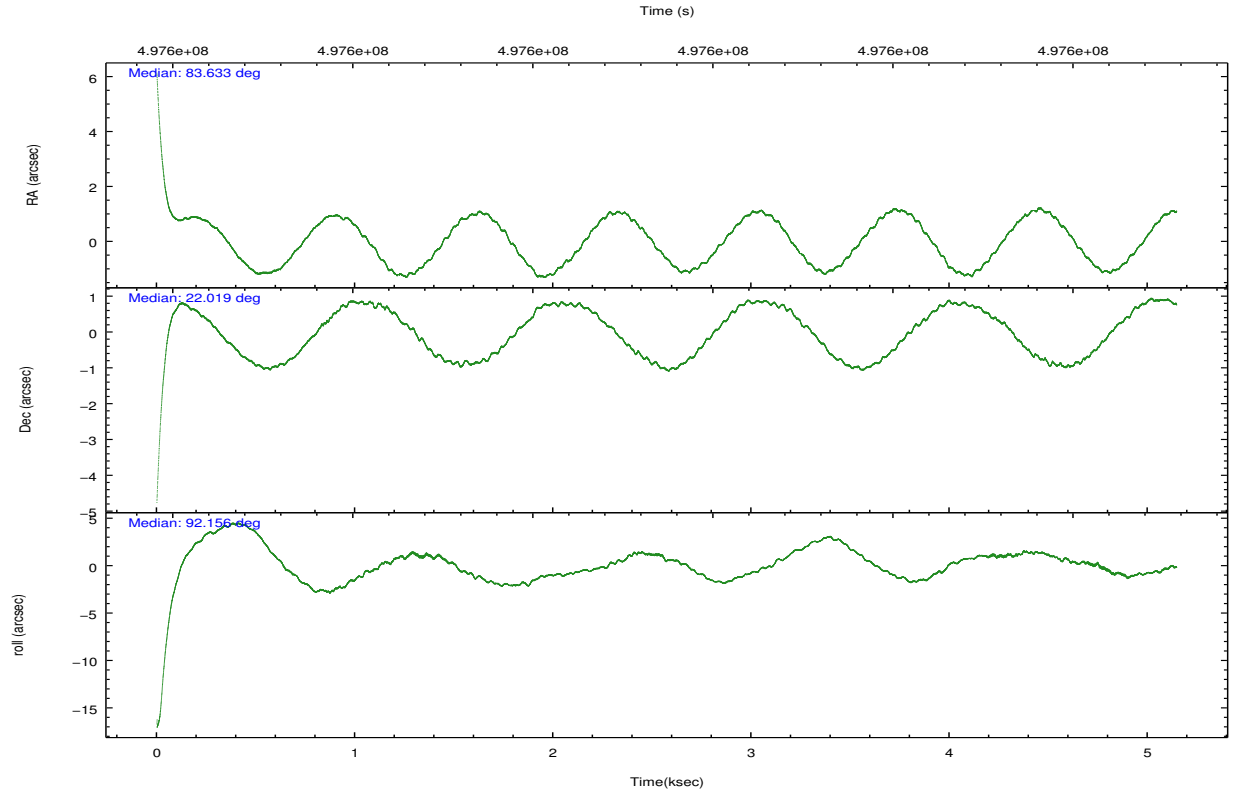
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-7	ACIS-7
Grating	NONE	NONE
Data mode	GRADED	GRADED
Observation mode	POINTING	POINTING
[deg] Pointing RA	83.649332	83.63329533017911
[deg] Pointing Dec	21.995562	22.018507106824
[deg] Pointing Roll	91.998887	92.16149710624963
[s] Window start time (MET)	496972867.184000	496972867.184000
[s] Window stop time (MET)	497836867.184000	497836867.184000
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-187.916523	-187.9098683773882
[mm] SIM translation stage offset	-2.216	-2.222654205619648
[s] Observation start time (MET)	497595317.184000	497594339.82989
Observation start date	2013-10-08T04:54:10	2013-10-08T04:38:59
[s] Observation end time (MET)	497600317.184000	497601141.73027
Observation end date	2013-10-08T06:17:30	2013-10-08T06:32:21
Read mode	TIMED	TIMED

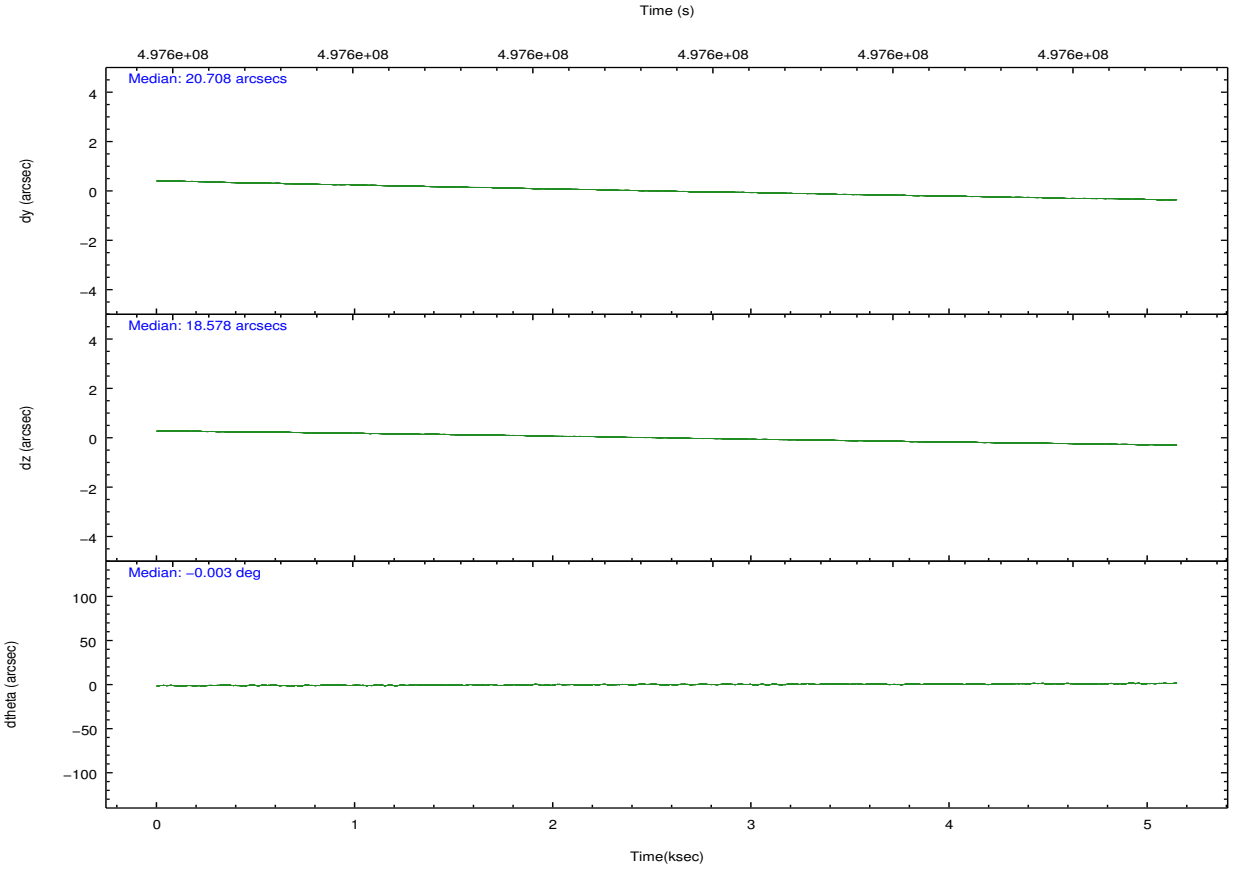
Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	CUSTOM	CUSTOM
Subarray start row	245	245
Subarray row count	300	300
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	0.2

2.3 Aspect


RA : 83.633 deg
Dec : 22.019 deg
Dec (arcsec)
RA (arcsec)
2
0
−2
−4
−6
0
2
4
6


DY : 20.708 arcsecs
DZ : 18.578 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−4
−2
0
2
4


Time (s)
4.976e+08
4.976e+08
4.976e+08
4.976e+08
4.976e+08
4.976e+08
Median: 83.633 deg
RA (arcsec)
Median: 22.019 deg
Dec (arcsec)
Median: 92.156 deg
roll (arcsec)
Time(ksec)

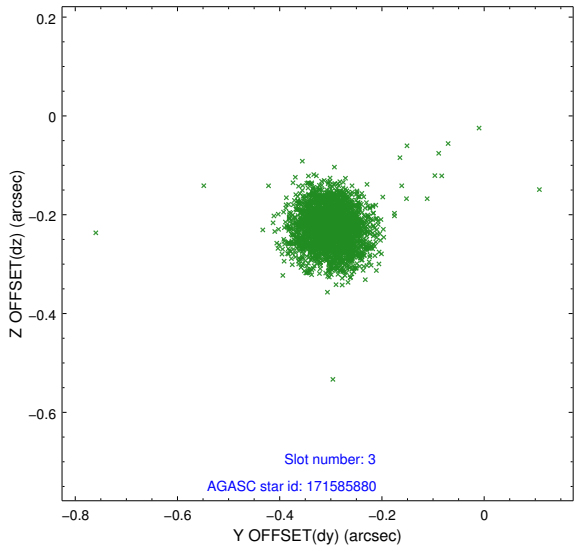

Time (s)
4.976e+08
4.976e+08
4.976e+08
4.976e+08
4.976e+08
4.976e+08
Median: 20.708 arcsecs
dy (arcsec)
Median: 18.578 arcsecs
dz (arcsec)
Median: −0.003 deg
dtheta (arcsec)
Time(ksec)

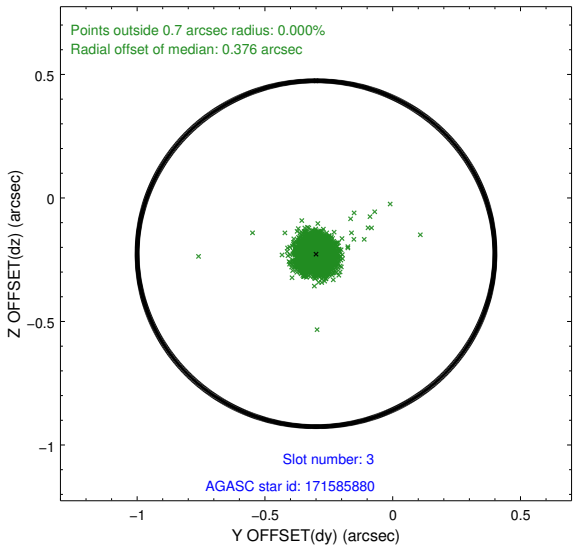
Slot Statistics

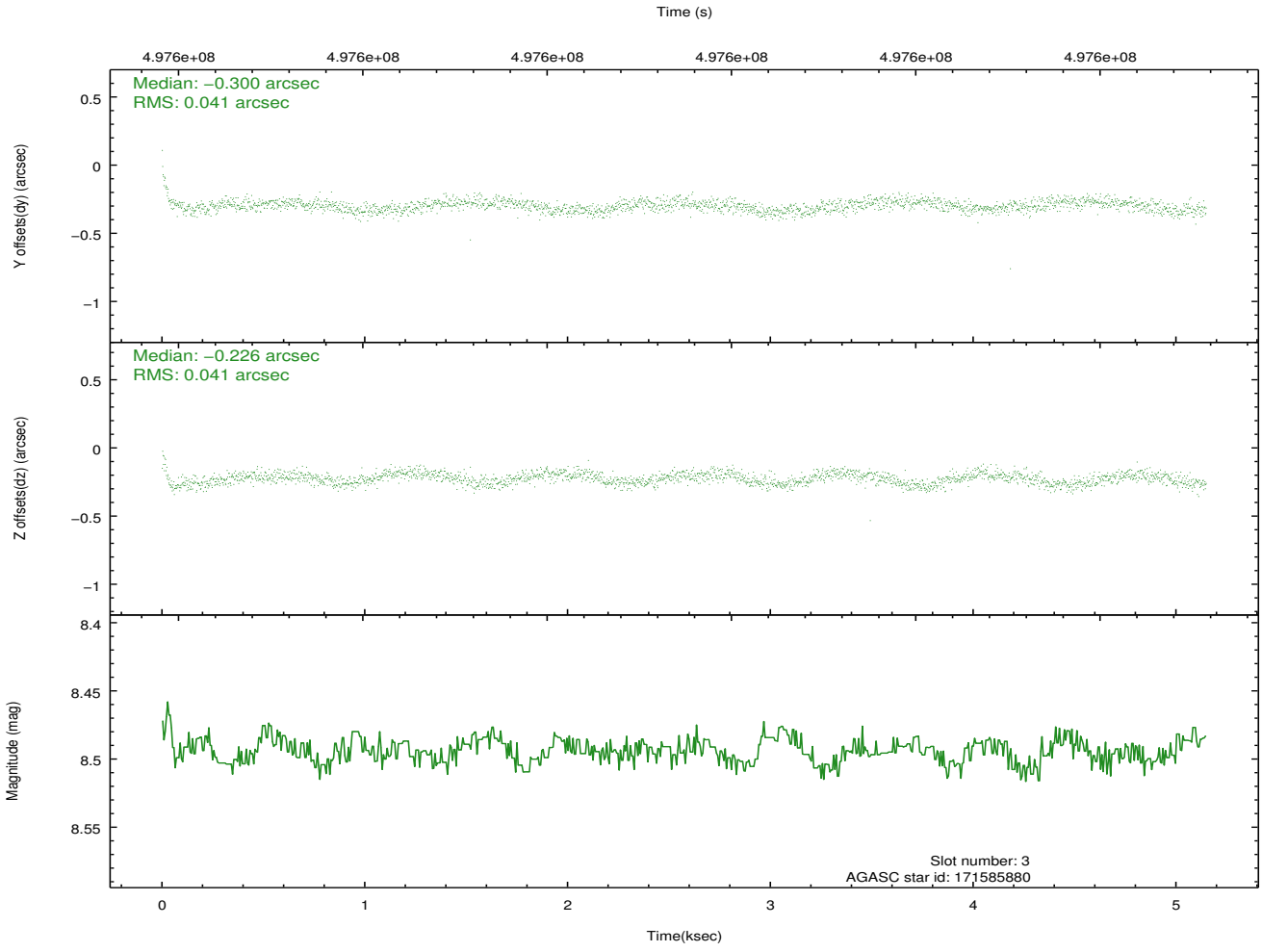
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-S-2	6.96	1256	-0.190	0.050	0.009	0.015	0.000000	0.000000	-773.90	-1785.92
1	FID		ACIS-S-4	7.05	1256	0.328	0.079	0.007	0.013	0.000000	0.000000	2139.38	121.29
2	FID		ACIS-S-5	7.09	1256	-0.169	-0.120	0.008	0.013	0.000000	0.000000	-1825.19	116.15
3	GUIDE	used	171585880	8.49	2509	-0.300	-0.226	0.059	0.093	83.676260	22.176319	647.17	-112.31
4	GUIDE	used	171586032	9.00	2511	-0.247	0.435	0.074	0.121	83.950197	22.083225	281.74	-1013.41
5	GUIDE	used	171597832	9.14	2512	0.356	-0.231	0.081	0.134	83.183230	21.366702	-2205.14	1640.07
6	GUIDE	used	171721904	9.15	2510	0.226	0.084	0.071	0.121	84.272676	22.116922	368.18	-2092.00
7	GUIDE	used	243941560	8.30	2510	-0.029	-0.055	0.063	0.099	83.733264	22.568598	2052.20	-351.06

2.4 Star Slots

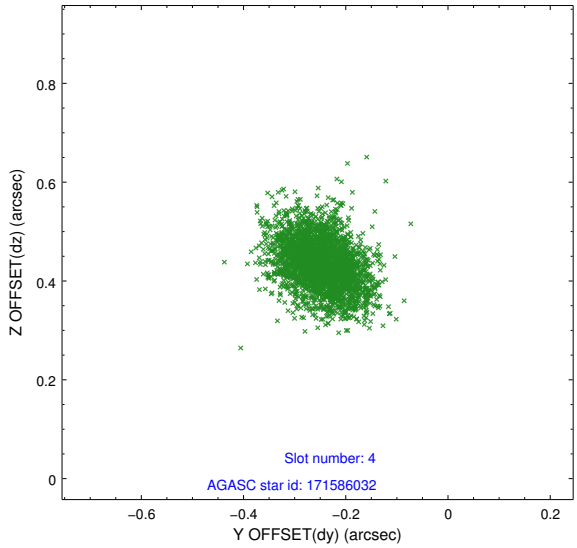
2.4.1 Slot 3

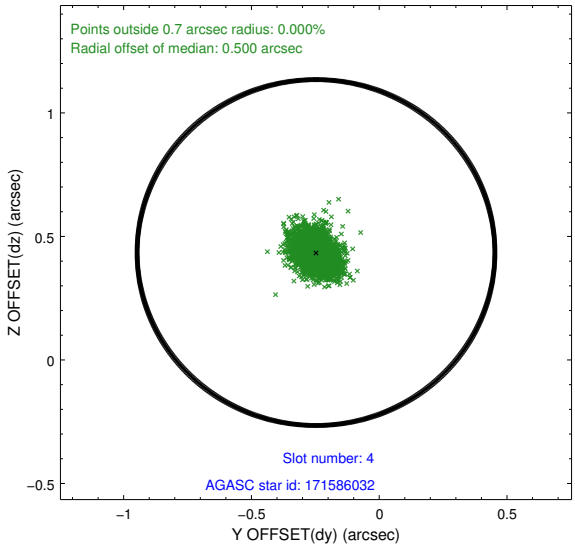


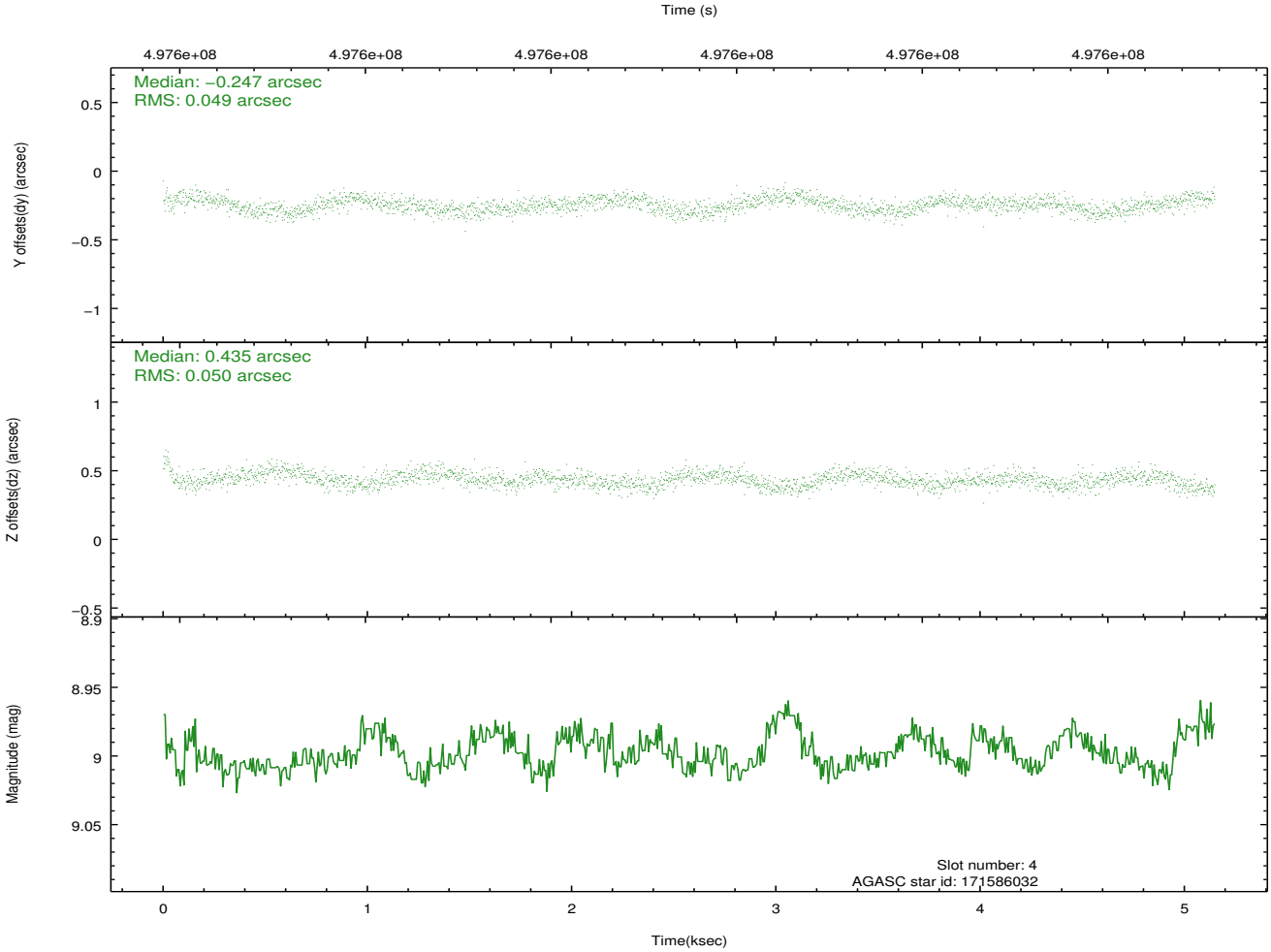




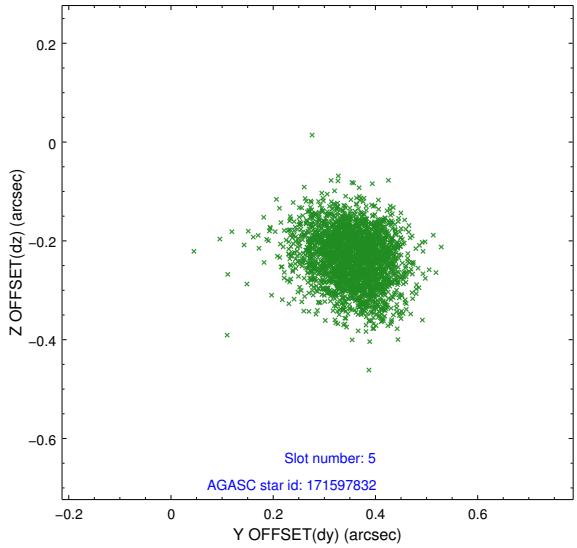
2.4.2 Slot 4

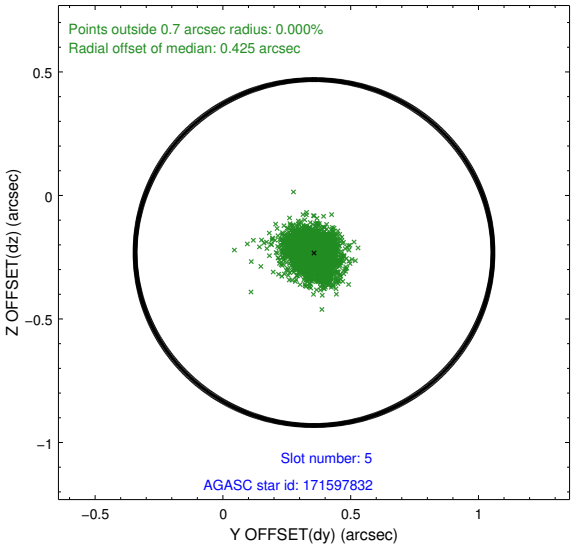

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 171586032

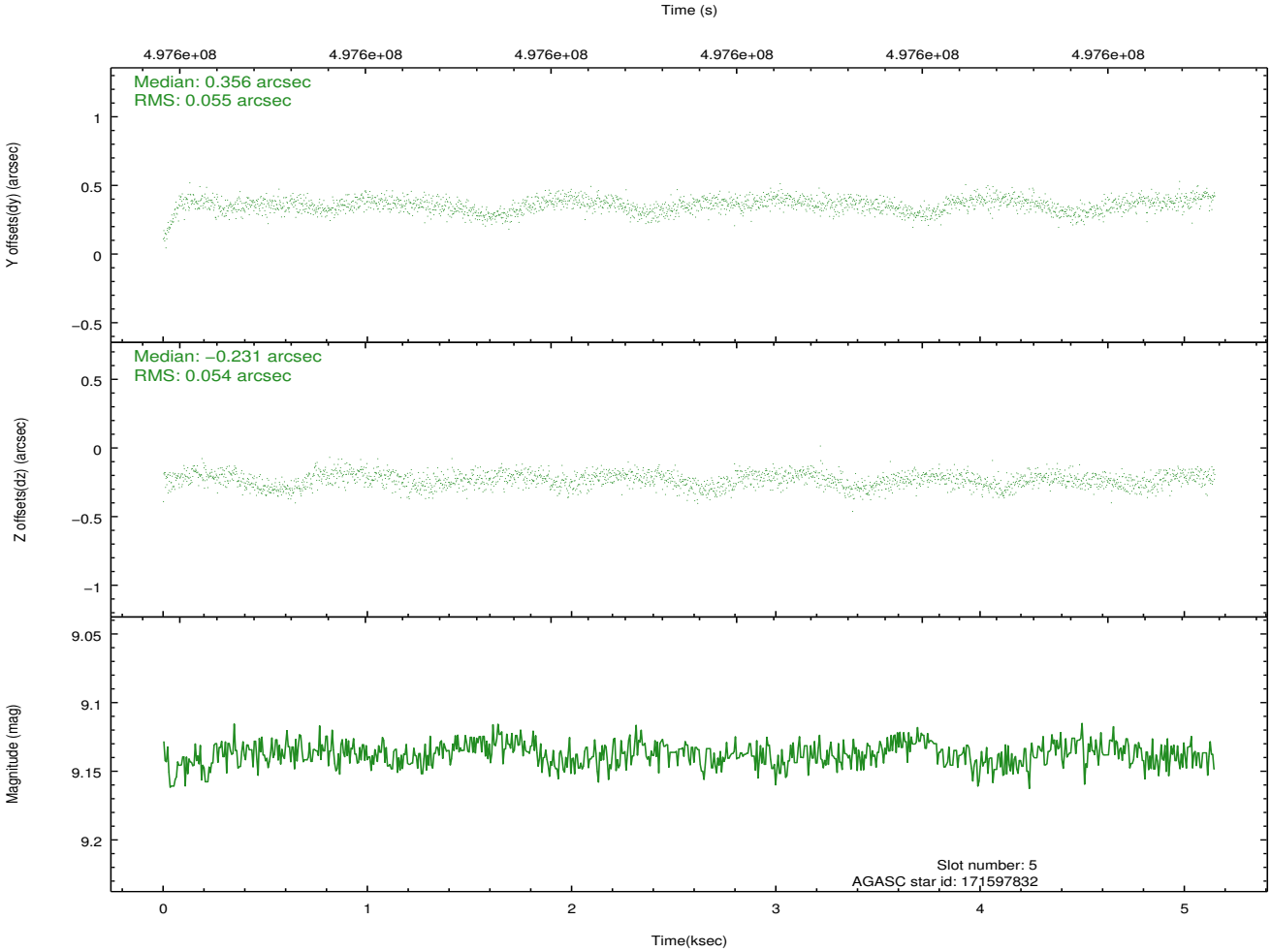

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.500 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 171586032


Time (s)
Median: −0.247 arcsec
RMS: 0.049 arcsec
Y offsets(dy) (arcsec)
Median: 0.435 arcsec
RMS: 0.050 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 171586032
Time(ksec)

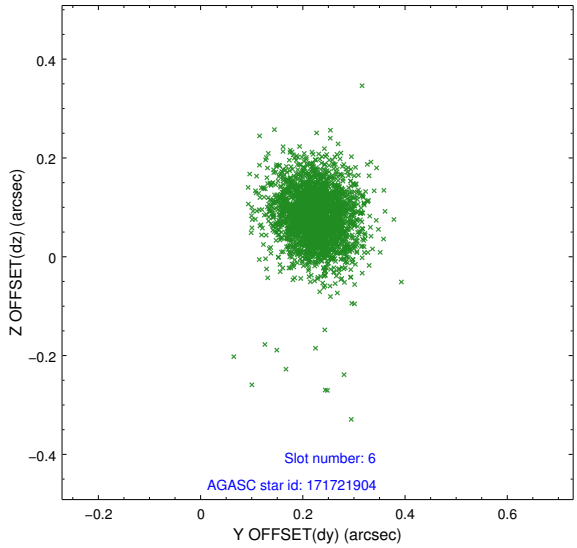
2.4.3 Slot 5

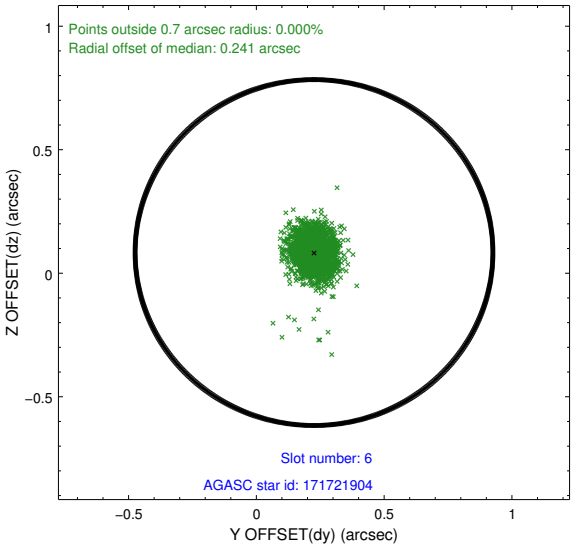

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 171597832

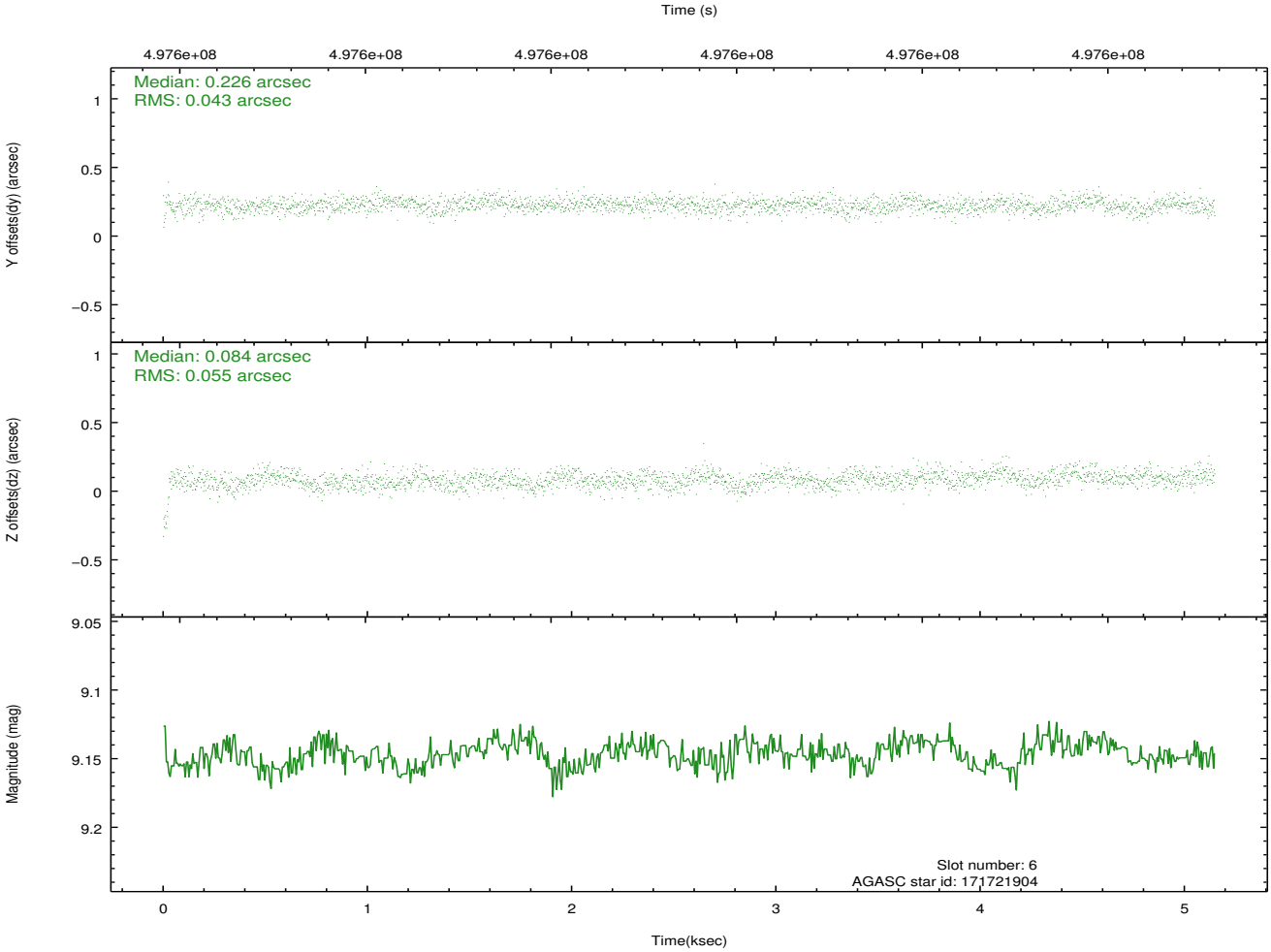

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.425 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 171597832


Time (s)
Median: 0.356 arcsec
RMS: 0.055 arcsec
Y offsets(dy) (arcsec)
Median: −0.231 arcsec
RMS: 0.054 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 171597832
Time(ksec)

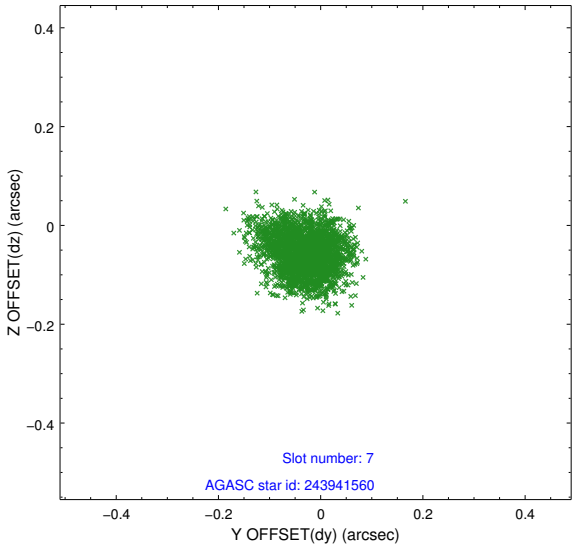
2.4.4 Slot 6

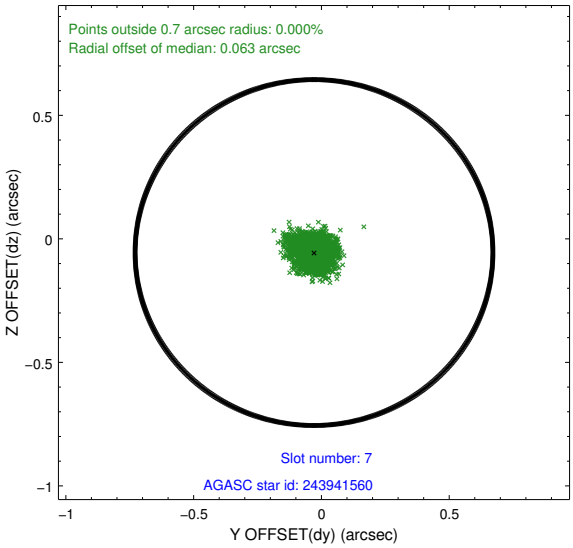

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 171721904

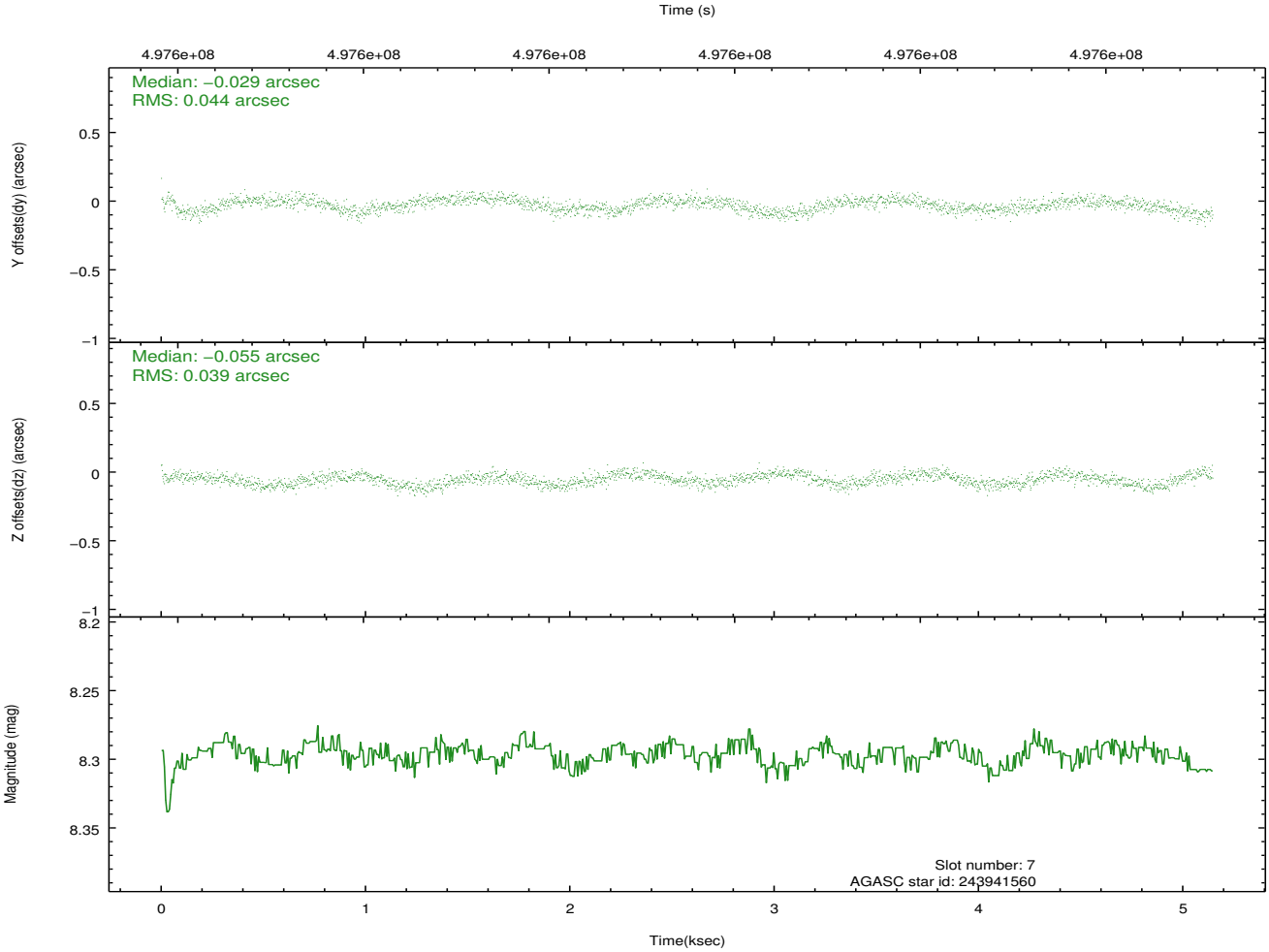

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.241 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 171721904


Time (s)
Median: 0.226 arcsec
RMS: 0.043 arcsec
Y offsets(dy) (arcsec)
Median: 0.084 arcsec
RMS: 0.055 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 171721904
Time(ksec)

2.4.5 Slot 7

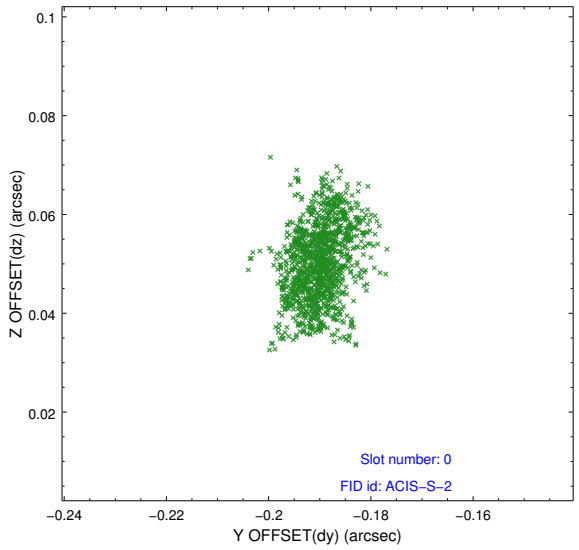

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 243941560

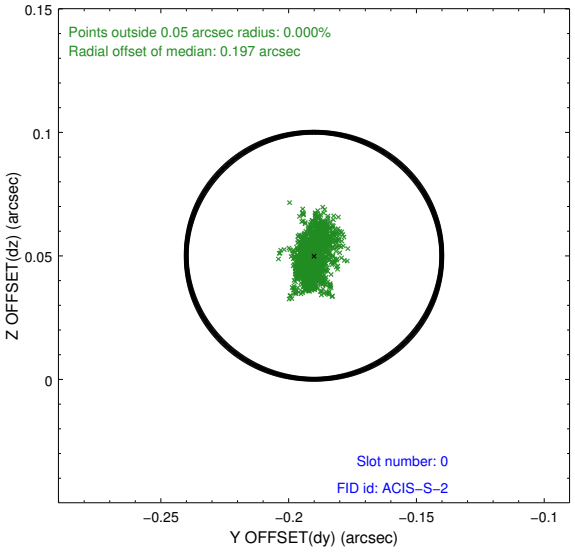

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.063 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 243941560

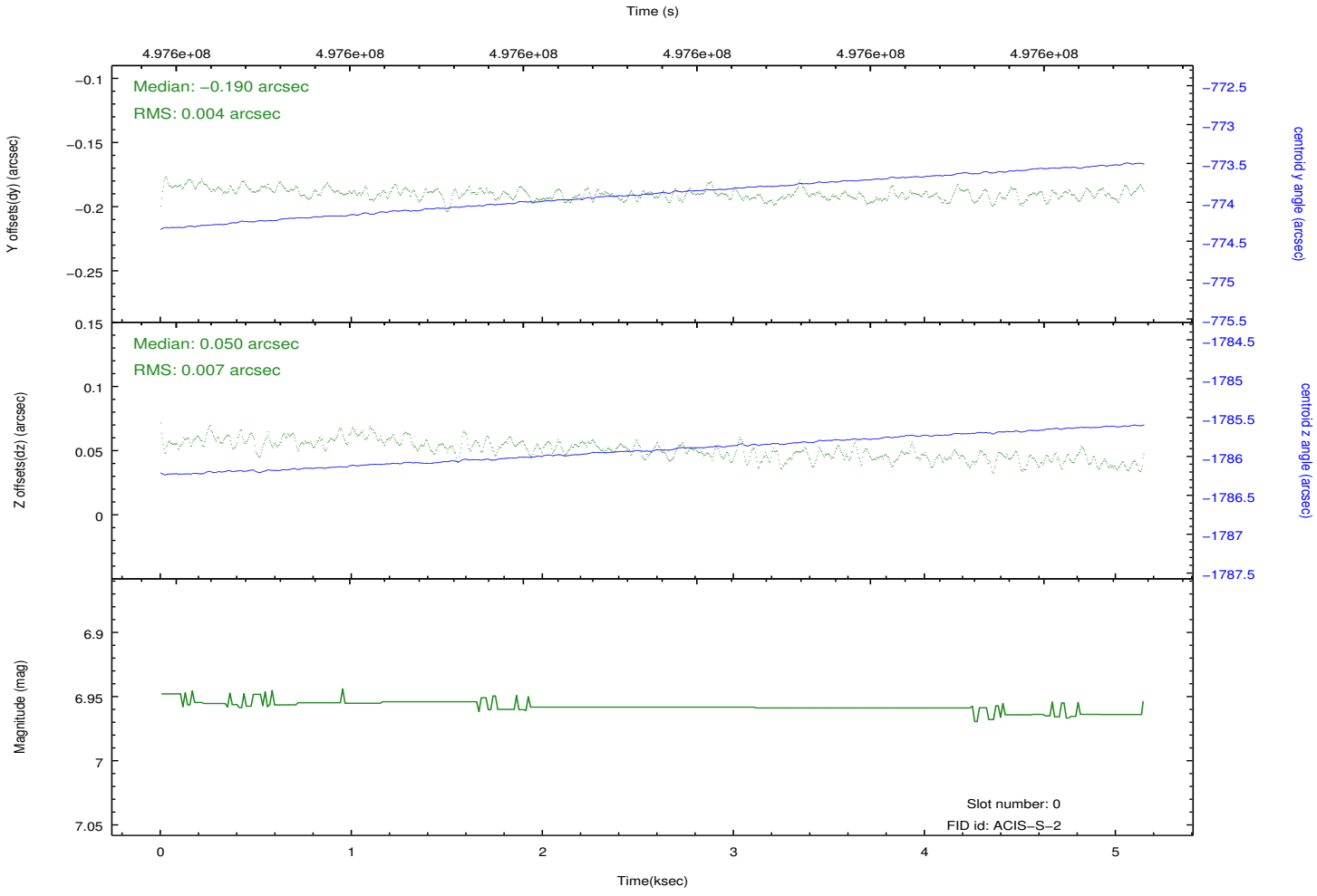

Time (s)
Median: −0.029 arcsec
RMS: 0.044 arcsec
Y offsets(dy) (arcsec)
Median: −0.055 arcsec
RMS: 0.039 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 243941560
Time(ksec)

2.5 FID Slots

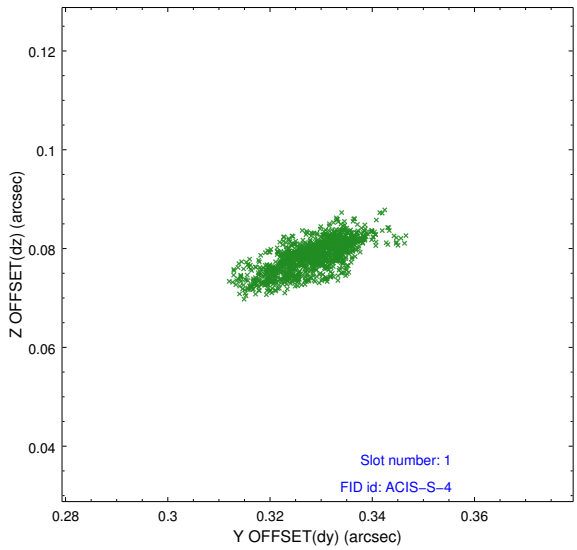
2.5.1 Slot 0

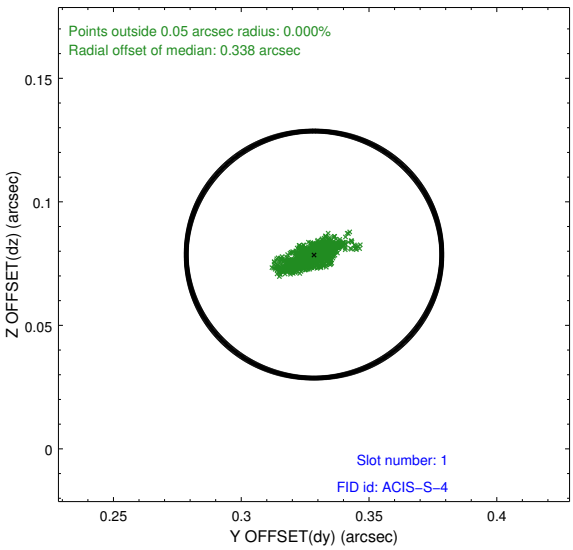


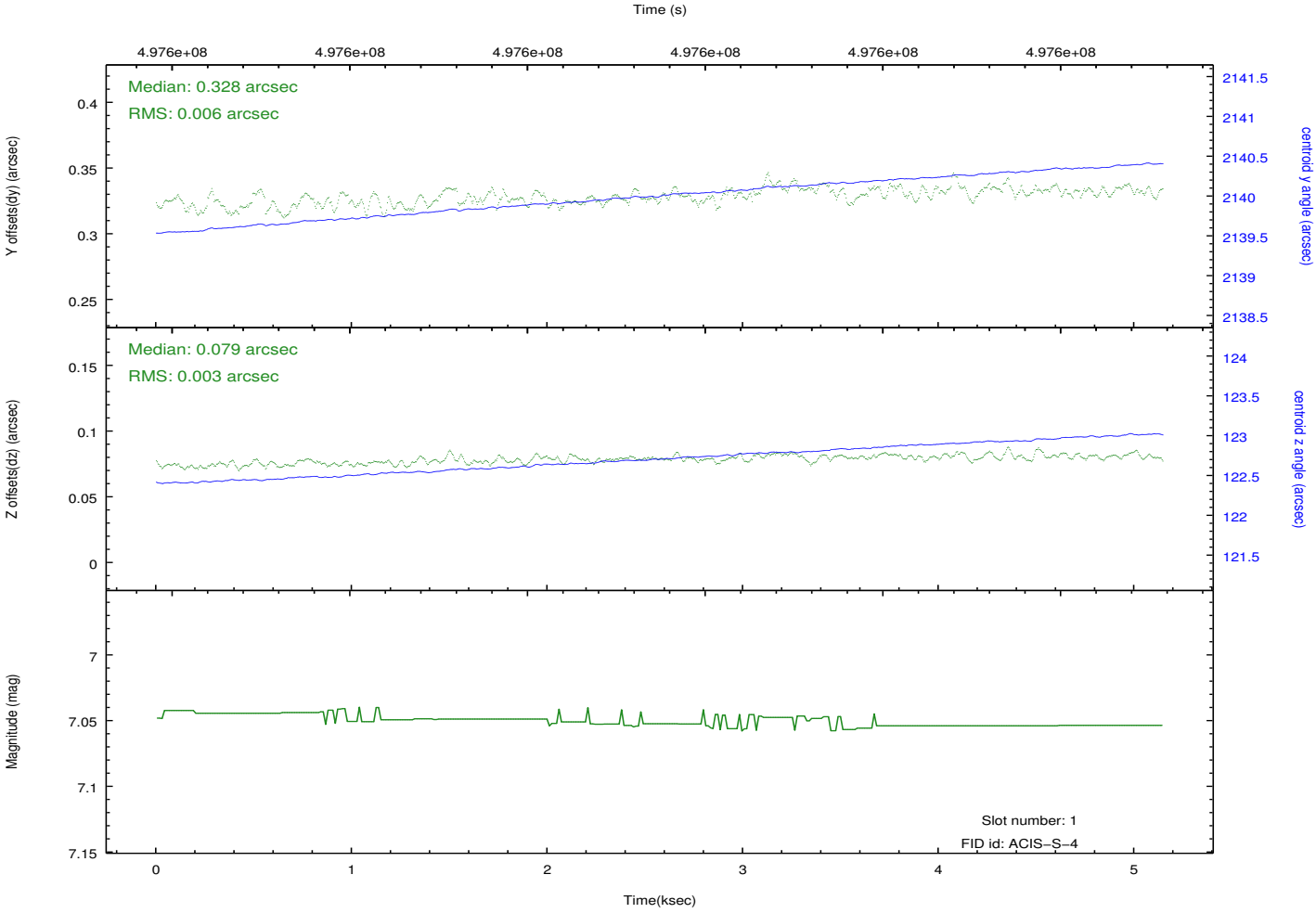




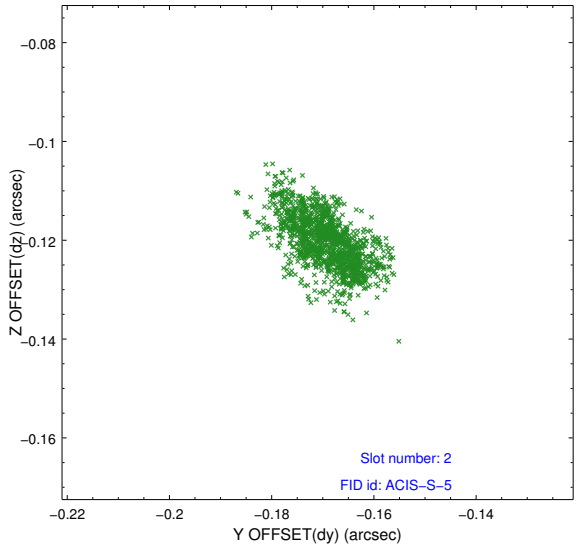
2.5.2 Slot 1

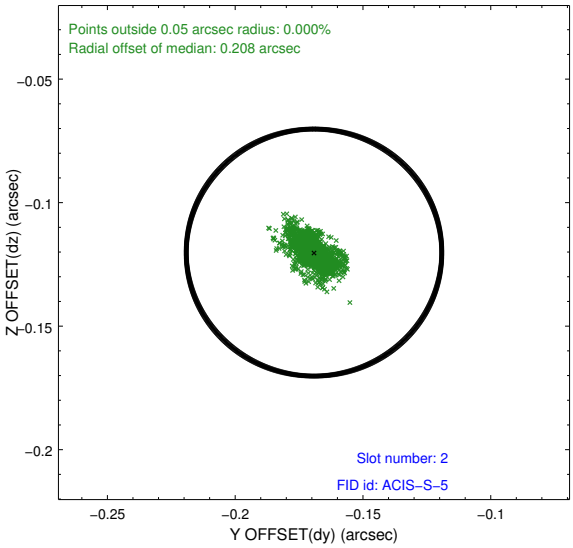

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4

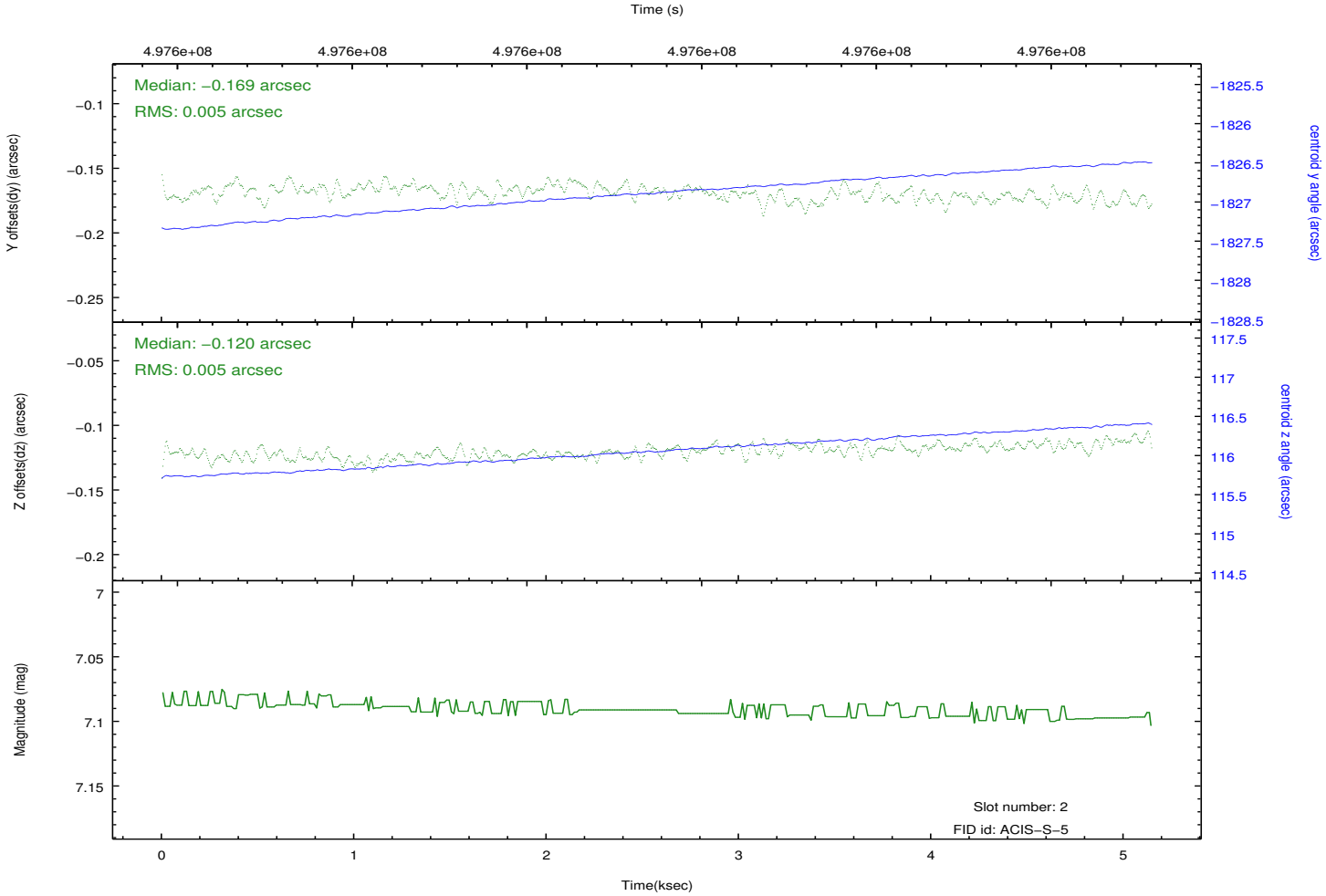

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.338 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4


Time (s)
Median: 0.328 arcsec
RMS: 0.006 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.079 arcsec
RMS: 0.003 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 1
FID id: ACIS−S−4
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: 0.208 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5


Time (s)
Median: −0.169 arcsec
RMS: 0.005 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: −0.120 arcsec
RMS: 0.005 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	Beth Sundheim
V&V Date (YYYY-MM-DD)	2014.12.12
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	3.6026827985048

A.2 Comments

```
Joint proposal with HST.
Observation coordinated with HST.
Window preference met.
The high count rate resulted in telemetry saturation and a large number
of dropped exposures. The ONTIME value reflects the lost exposure time.
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.
```