V&V Reference Report
L2 ASCDS Version : 10

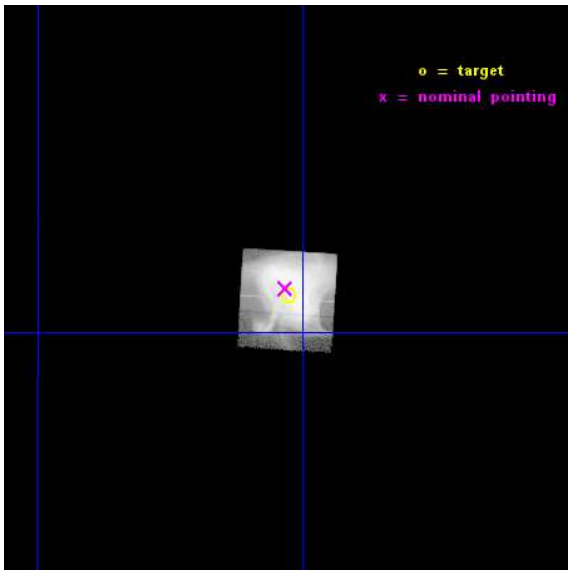
Observation 14682 - L2 Version 2
Chandra X-Ray Center

L2 Processing Date : Dec 6 2014

Contents

1 Front

seq_num	501816	Sequence number
obs_id	14682	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	83.633237491788	Nominal RA [deg]
dec_nom	22.018533360659	Nominal Dec [deg]
roll_nom	93.425511842713	Nominal Roll [deg]
revision	2	Processing version of data
ontime	3563.7511508465	Sum of GTIs [s]
livetime	617.78441057562	Livetime [s]
ontime7	3563.7511508465	Sum of GTIs [s]
l2events	1711359	Number of level 2 events

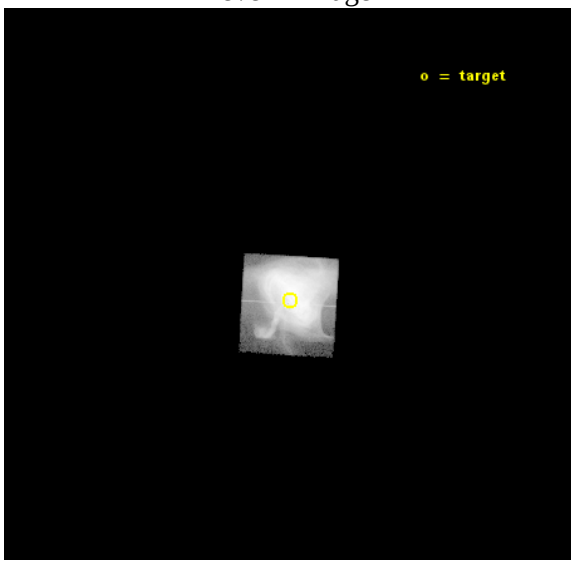


2 OBI

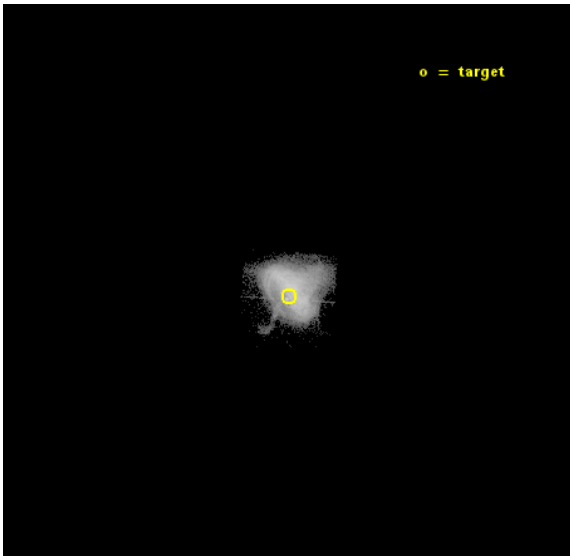
2.1 OBI

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	2014-12-06T05:55:22	Date and time of file creation
revision	2	Processing version of data

sched_exp_time	5000.000000	[s] Scheduled observation exposure time
ontime	3563.7511508465	Sum of GTIs [s]
ontime7	3563.7511508465	Sum of GTIs [s]
l1events	1888654	Number of level 1 events

2.1.3 Events

	ccd 7
level 1 events	1888654
rejected events	167163
rejected %	8%

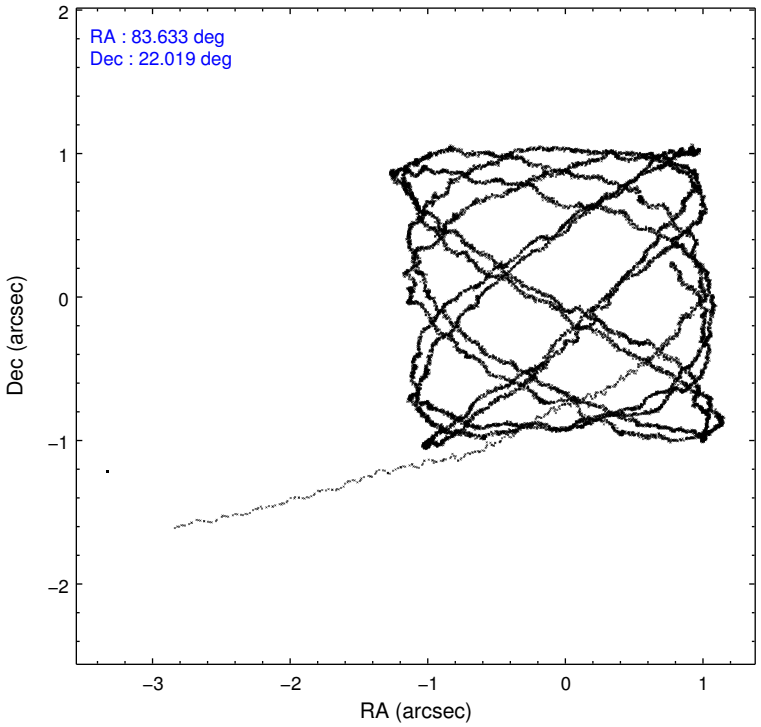
	ccd 7
grade 0 events	375784
	19%
grade 1 events	20482
	1%
grade 2 events	479068
	25%
grade 3 events	188275
	9%
grade 4 events	186714
	9%
grade 5 events	60483
	3%
grade 6 events	492735
	26%
grade 7 events	85113
	4%

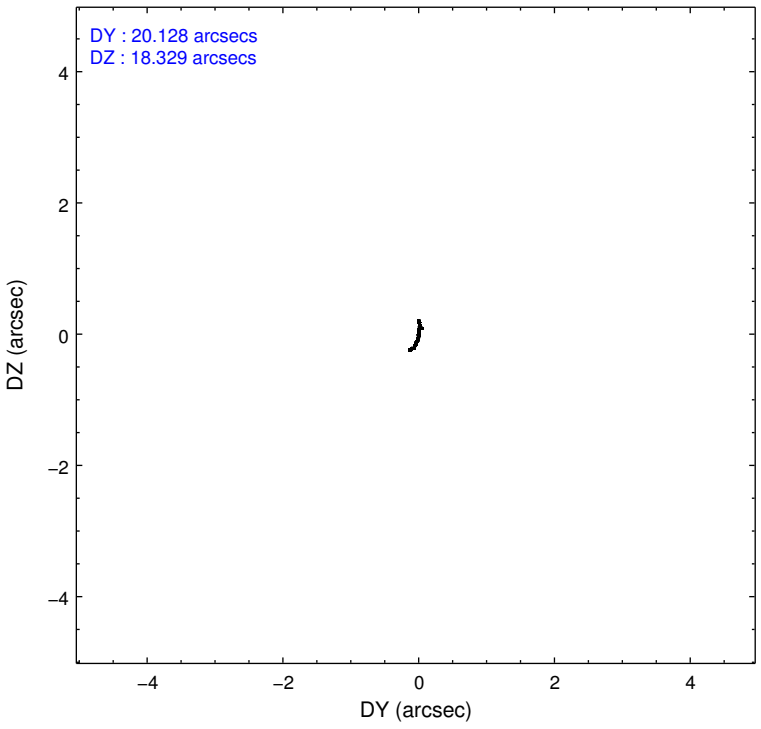
2.2 Compared Parameters

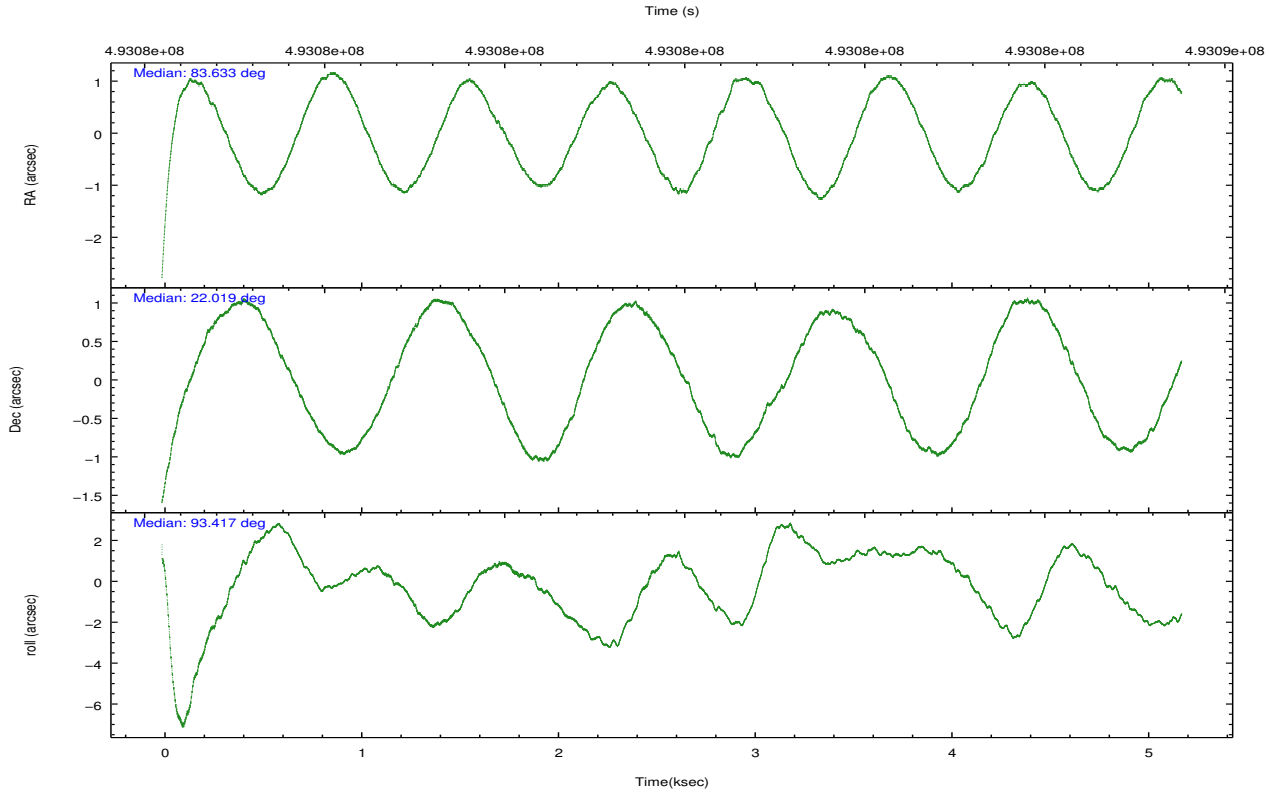
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-7	ACIS-7
Grating	NONE	NONE
Data mode	GRADED	GRADED
Observation mode	POINTING	POINTING
[deg] Pointing RA	83.649809	83.63323749178755
[deg] Pointing Dec	21.995923	22.01853336065886
[deg] Pointing Roll	93.262670	93.42551184271302
[s] Window start time (MET)	492652867.184000	492652867.184000
[s] Window stop time (MET)	493516867.184000	493516867.184000
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-188.876523	-188.8728511378856
[mm] SIM translation stage offset	-1.256	-1.259671445122166
[s] Observation start time (MET)	493080520.184000	493079978.20844
Observation start date	2013-08-16T22:47:33	2013-08-16T22:39:38
[s] Observation end time (MET)	493085520.184000	493086269.65878
Observation end date	2013-08-17T00:10:53	2013-08-17T00:24:29
Read mode	TIMED	TIMED

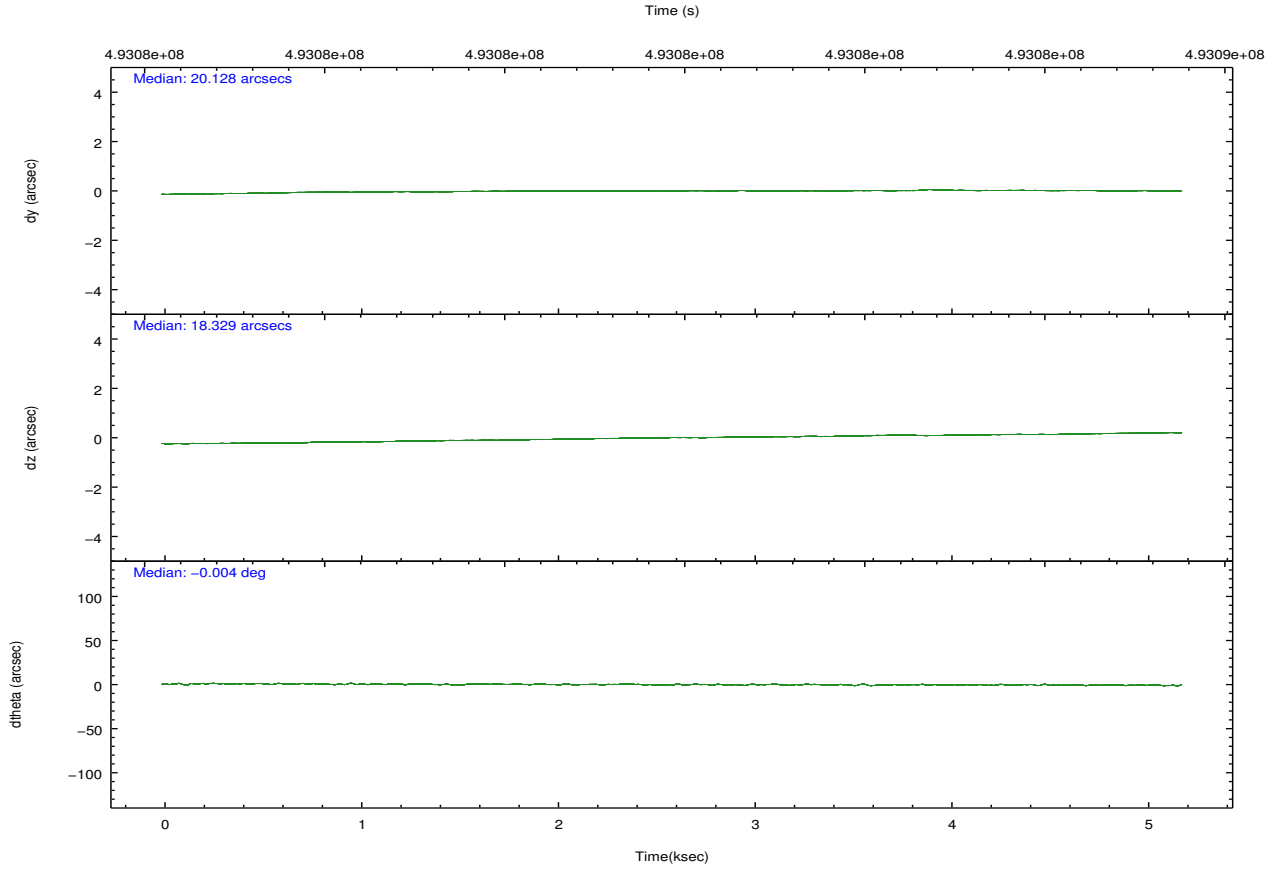
Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	CUSTOM	CUSTOM
Subarray start row	285	285
Subarray row count	300	300
Alternating exposures 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
1
0
−1
−2
−3
−2
−1
0
1


DY : 20.128 arcsecs
DZ : 18.329 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−4
−2
0
2
4


Time (s)
4.9308e+08
4.9308e+08
4.9308e+08
4.9308e+08
4.9308e+08
4.9308e+08
4.9309e+08
Median: 83.633 deg
RA (arcsec)
Median: 22.019 deg
Dec (arcsec)
Median: 93.417 deg
roll (arcsec)
Time(ksec)

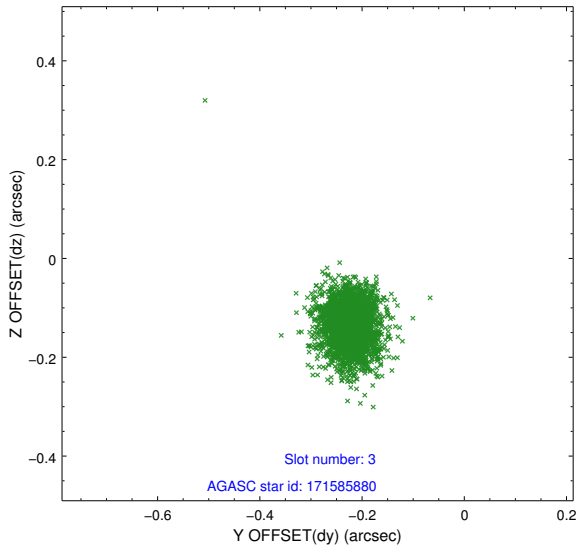

Time (s)
4.9308e+08
4.9308e+08
4.9308e+08
4.9308e+08
4.9308e+08
4.9308e+08
4.9309e+08
Median: 20.128 arcsecs
dy (arcsec)
Median: 18.329 arcsecs
dz (arcsec)
Median: −0.004 deg
dtheta (arcsec)
Time(ksec)

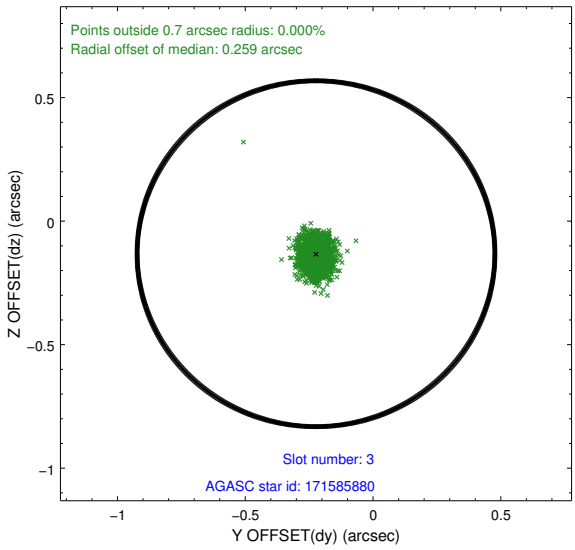
Slot Statistics

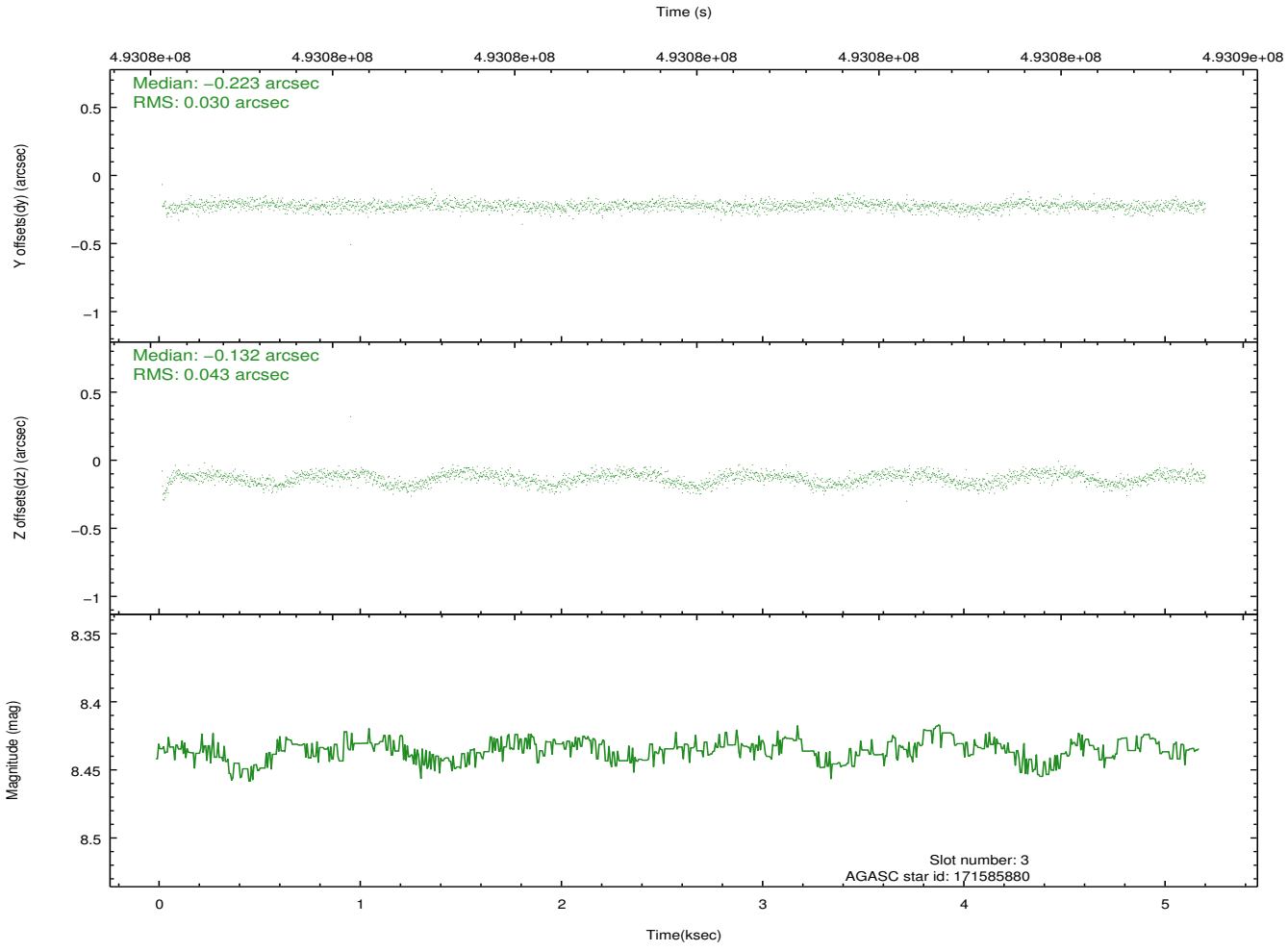
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-S-2	6.93	1265	-0.172	-0.036	0.007	0.012	0.000000	0.000000	-773.30	-1765.92
1	FID		ACIS-S-4	7.01	1265	0.292	0.093	0.005	0.009	0.000000	0.000000	2139.89	141.46
2	FID		ACIS-S-5	7.04	1265	-0.151	-0.048	0.008	0.013	0.000000	0.000000	-1824.64	136.31
3	GUIDE	used	171585880	8.44	2529	-0.223	-0.132	0.055	0.091	83.676260	22.176319	643.46	-124.87
4	GUIDE	used	171586032	8.99	2530	-0.276	0.217	0.064	0.100	83.950197	22.083225	258.17	-1018.01
5	GUIDE	used	171597832	9.14	2529	0.381	-0.163	0.069	0.117	83.183230	21.366702	-2169.66	1689.84
6	GUIDE	used	171721904	9.25	2529	0.252	0.006	0.075	0.124	84.272676	22.116922	320.92	-2098.10
7	GUIDE	used	243941560	8.35	2528	-0.132	0.075	0.067	0.112	83.733264	22.568598	2042.71	-394.42

2.4 Star Slots

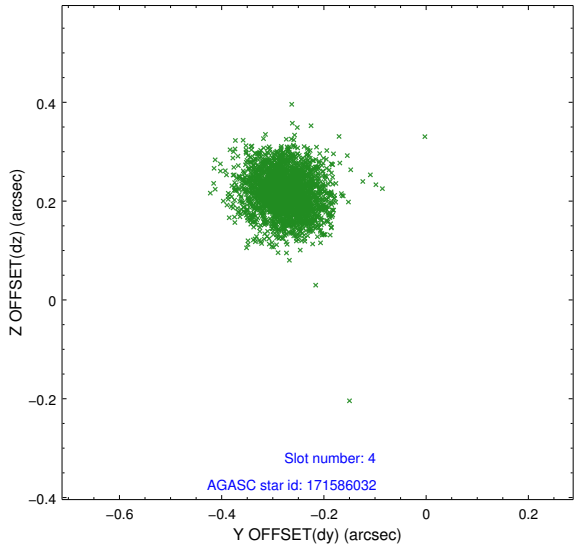
2.4.1 Slot 3

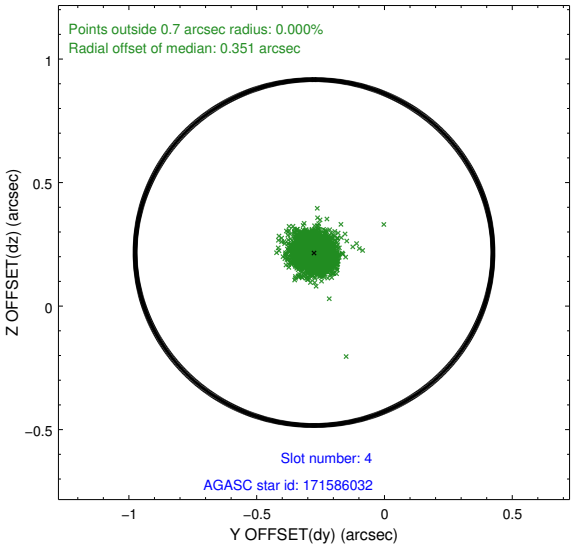


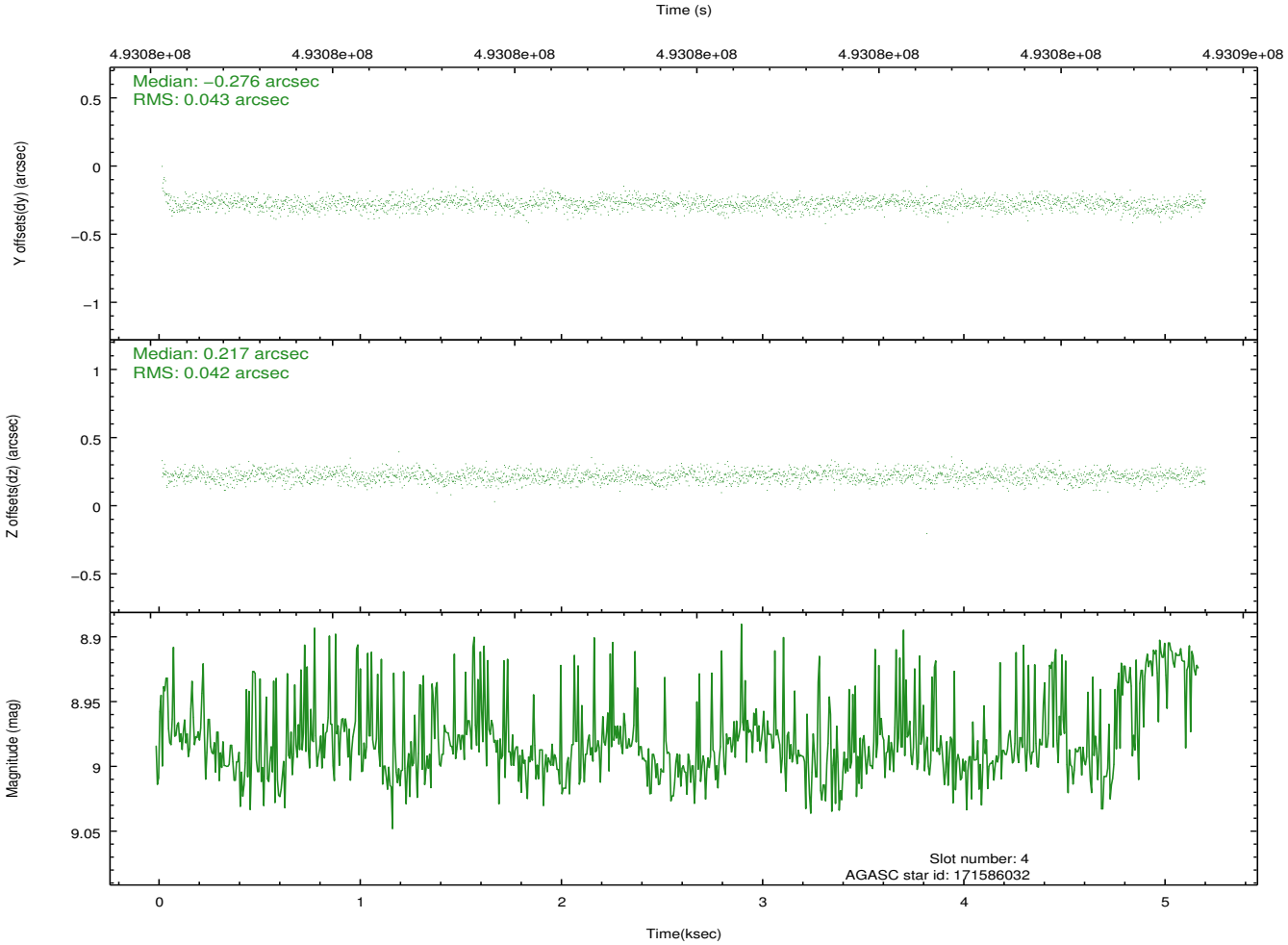




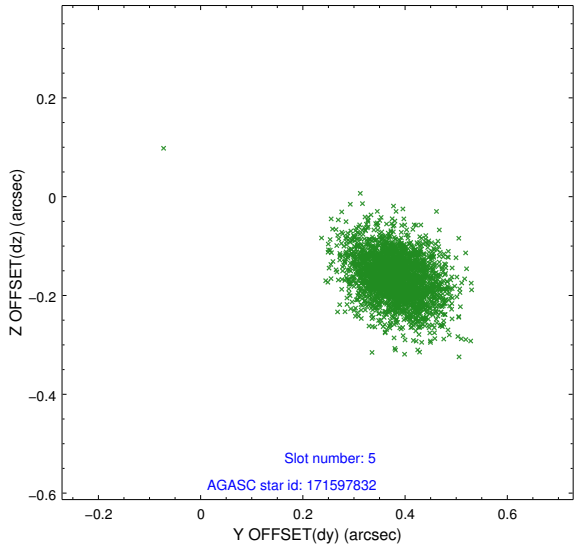
2.4.2 Slot 4

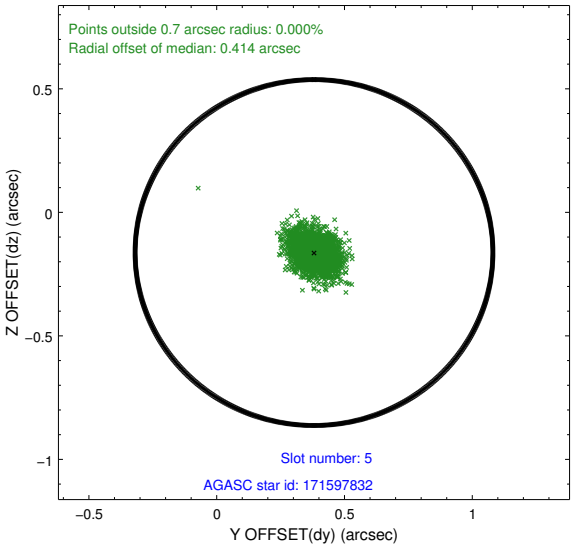

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 171586032

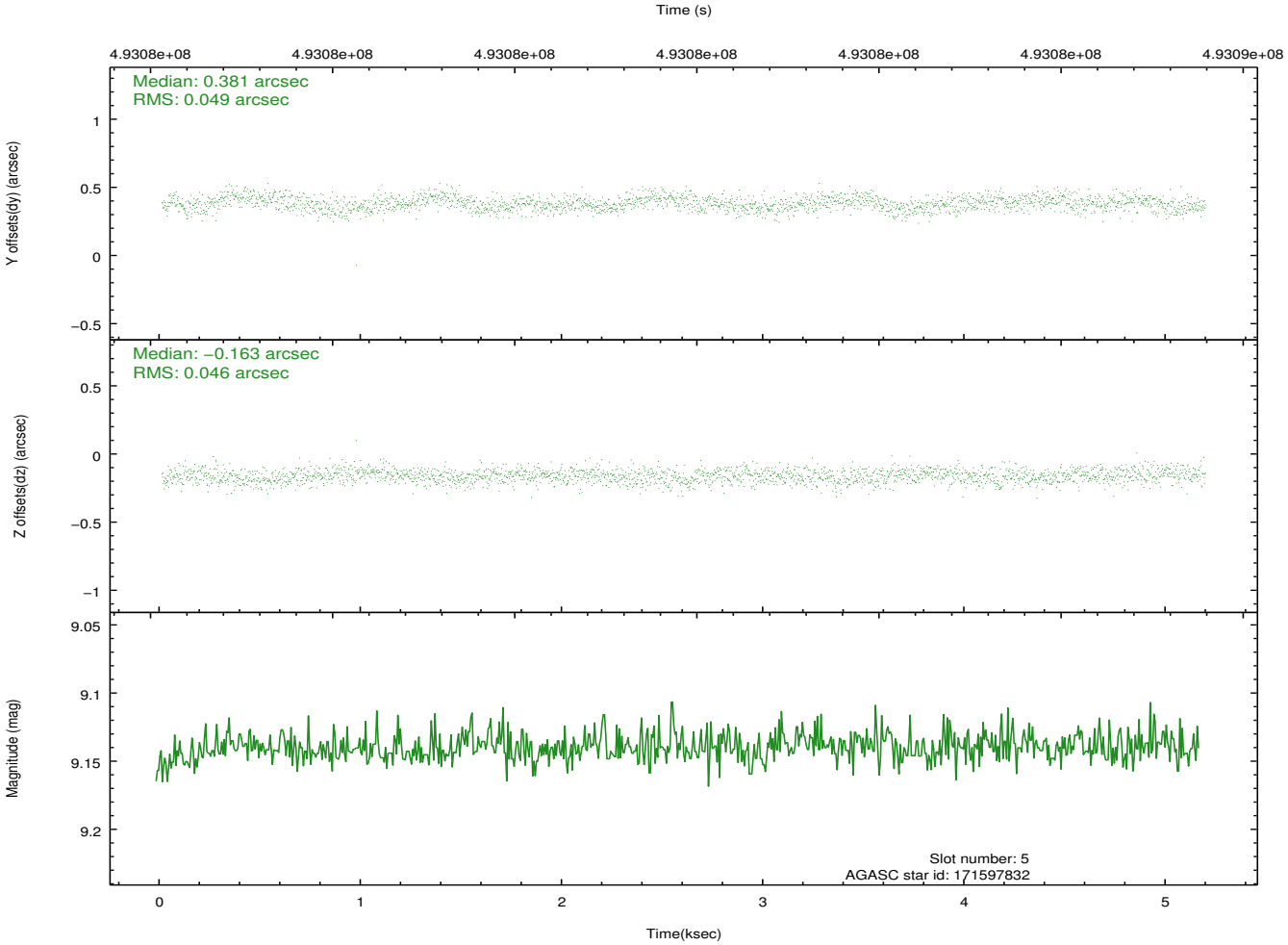

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.351 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 171586032


Time (s)
Median: −0.276 arcsec
RMS: 0.043 arcsec
Y offsets(dy) (arcsec)
Median: 0.217 arcsec
RMS: 0.042 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 171586032
Time(ksec)

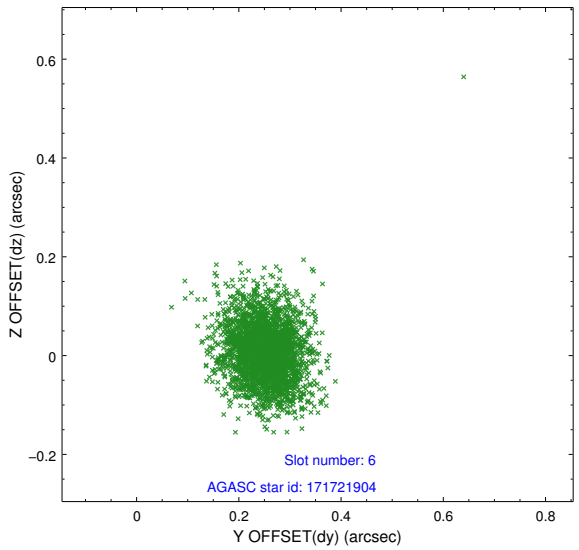
2.4.3 Slot 5

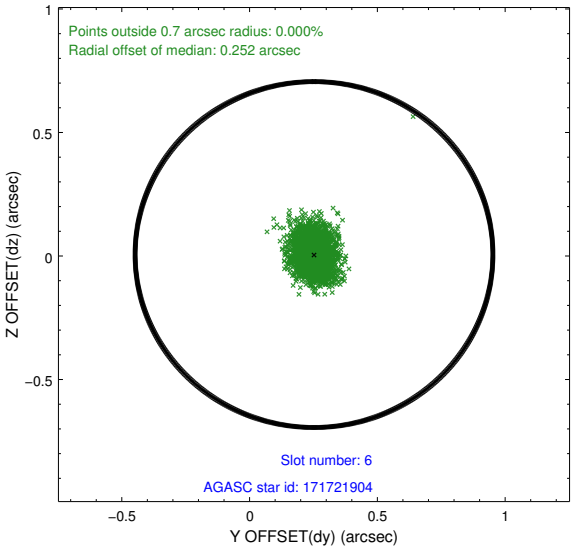

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 171597832

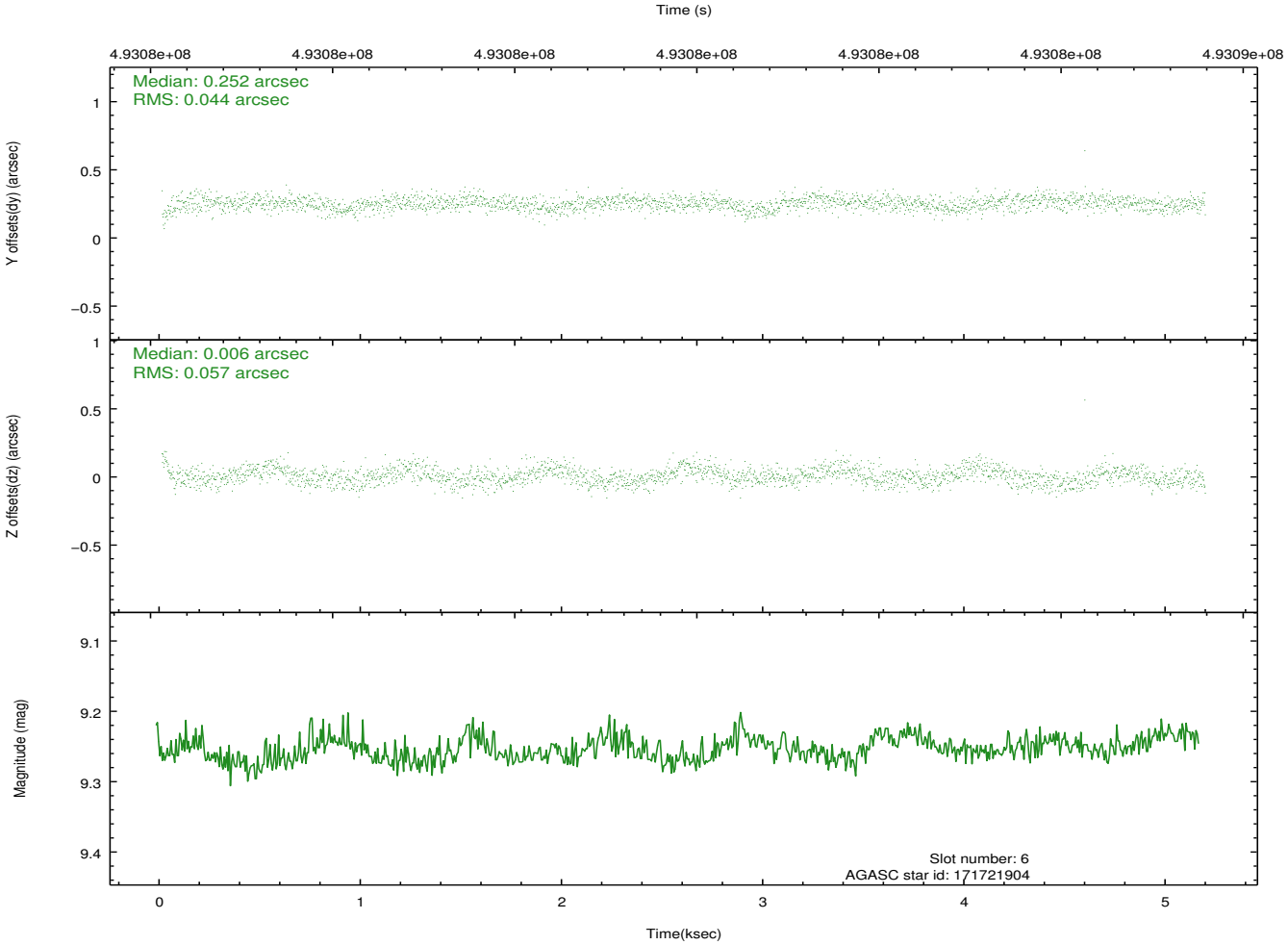

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.414 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 171597832


Time (s)
Median: 0.381 arcsec
RMS: 0.049 arcsec
Y offsets(dy) (arcsec)
Median: −0.163 arcsec
RMS: 0.046 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 171597832
Time(ksec)

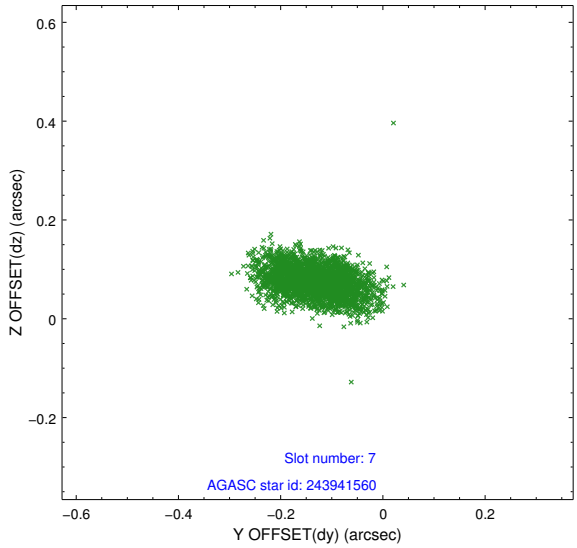
2.4.4 Slot 6

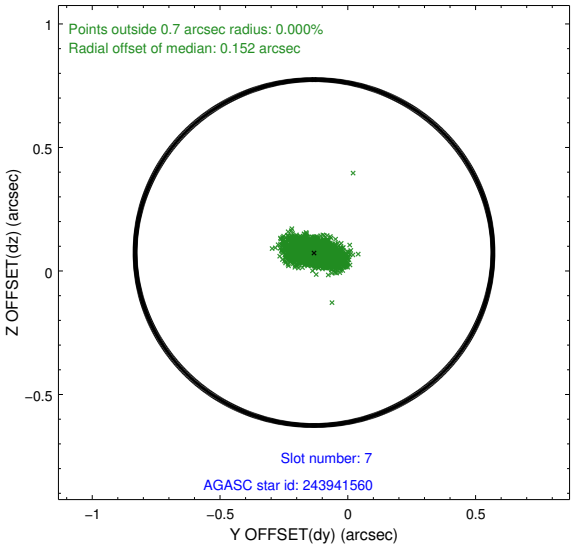

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 171721904

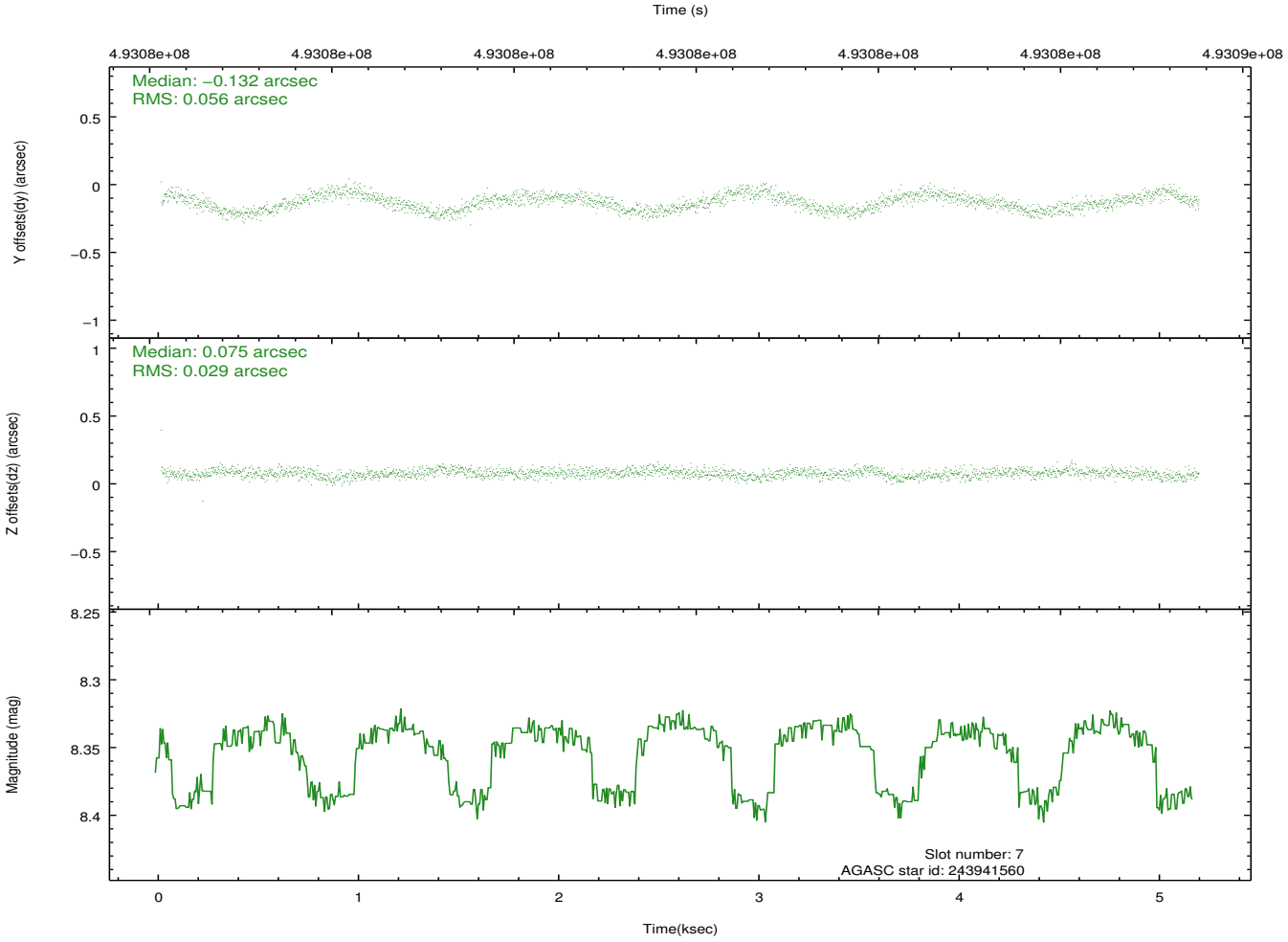

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.252 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 171721904


Time (s)
Median: 0.252 arcsec
RMS: 0.044 arcsec
Y offsets(dy) (arcsec)
Median: 0.006 arcsec
RMS: 0.057 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 171721904
Time(ksec)

2.4.5 Slot 7

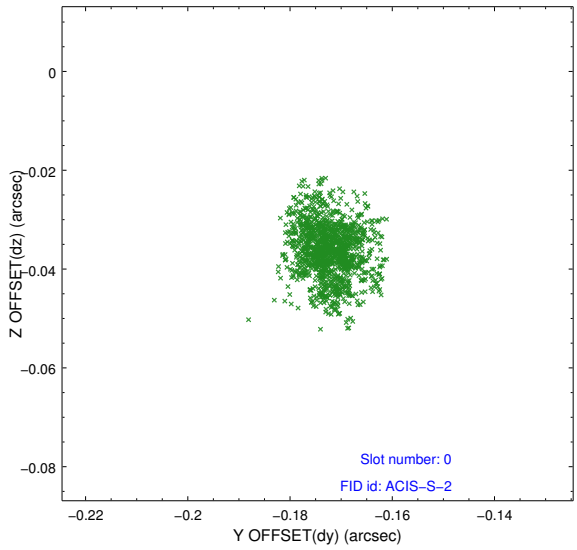

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 243941560

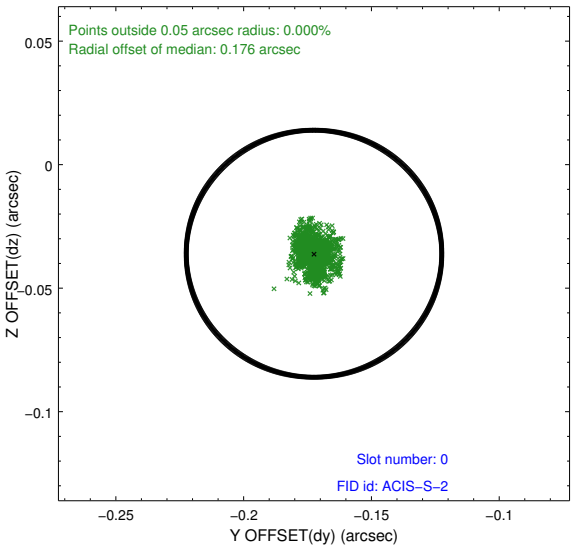

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.152 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 243941560

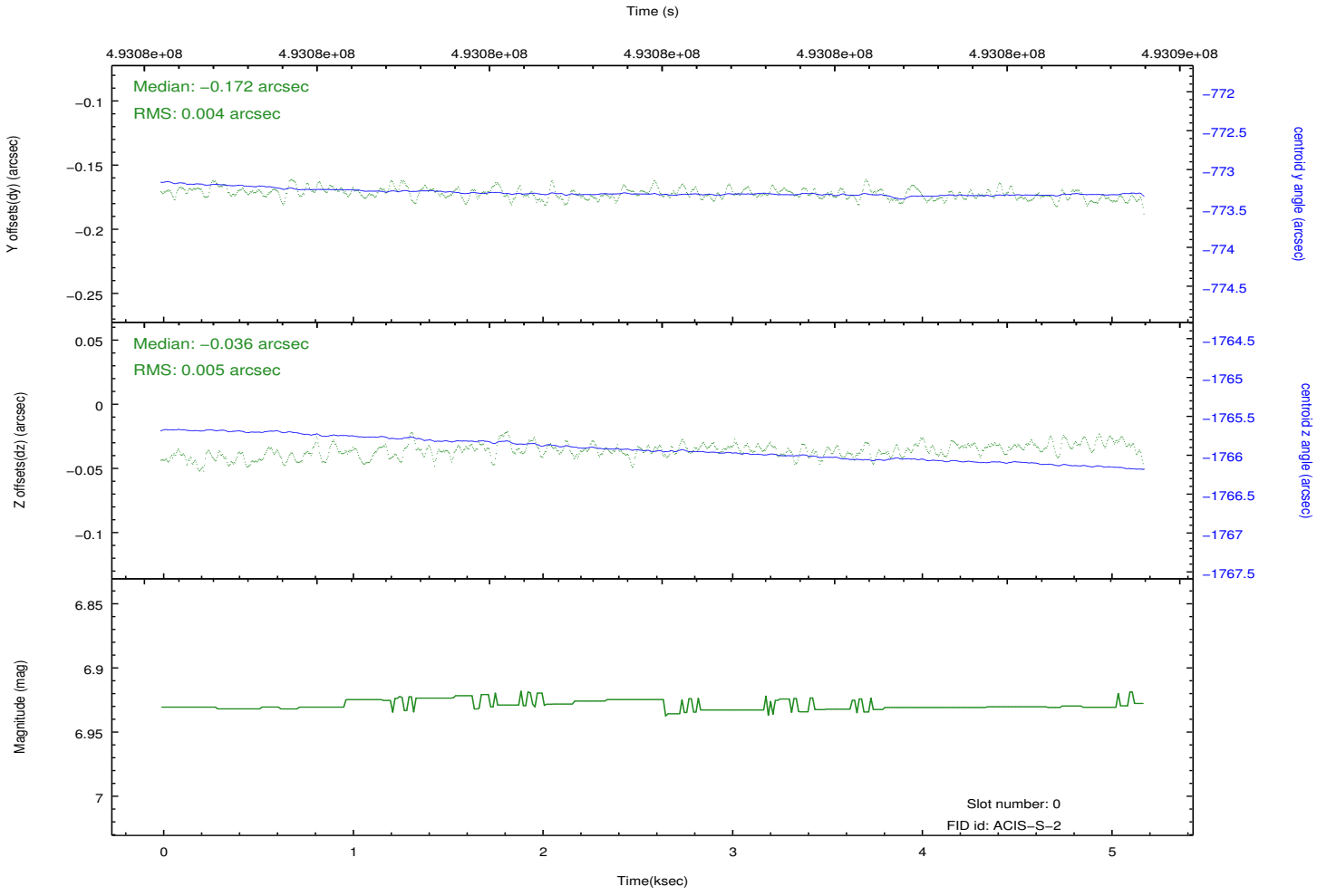

Time (s)
Median: −0.132 arcsec
RMS: 0.056 arcsec
Y offsets(dy) (arcsec)
Median: 0.075 arcsec
RMS: 0.029 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 243941560
Time(ksec)

2.5 FID Slots

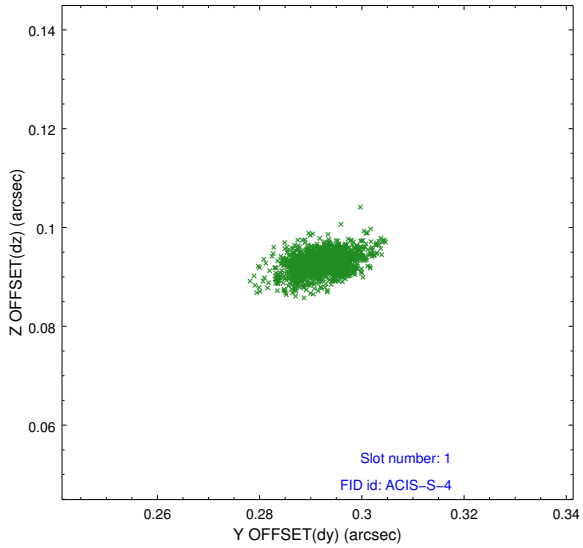
2.5.1 Slot 0

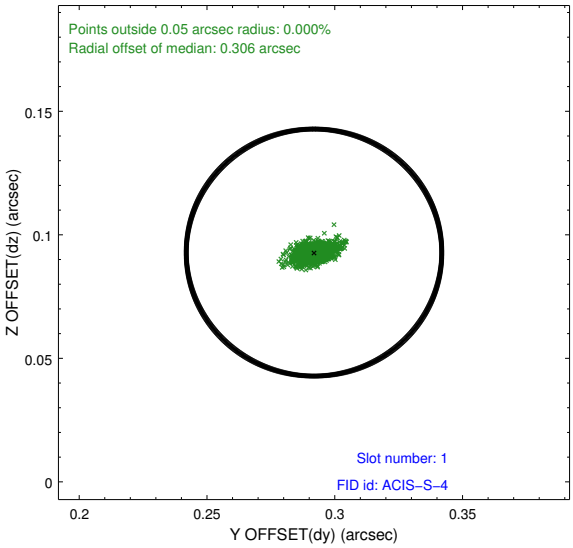


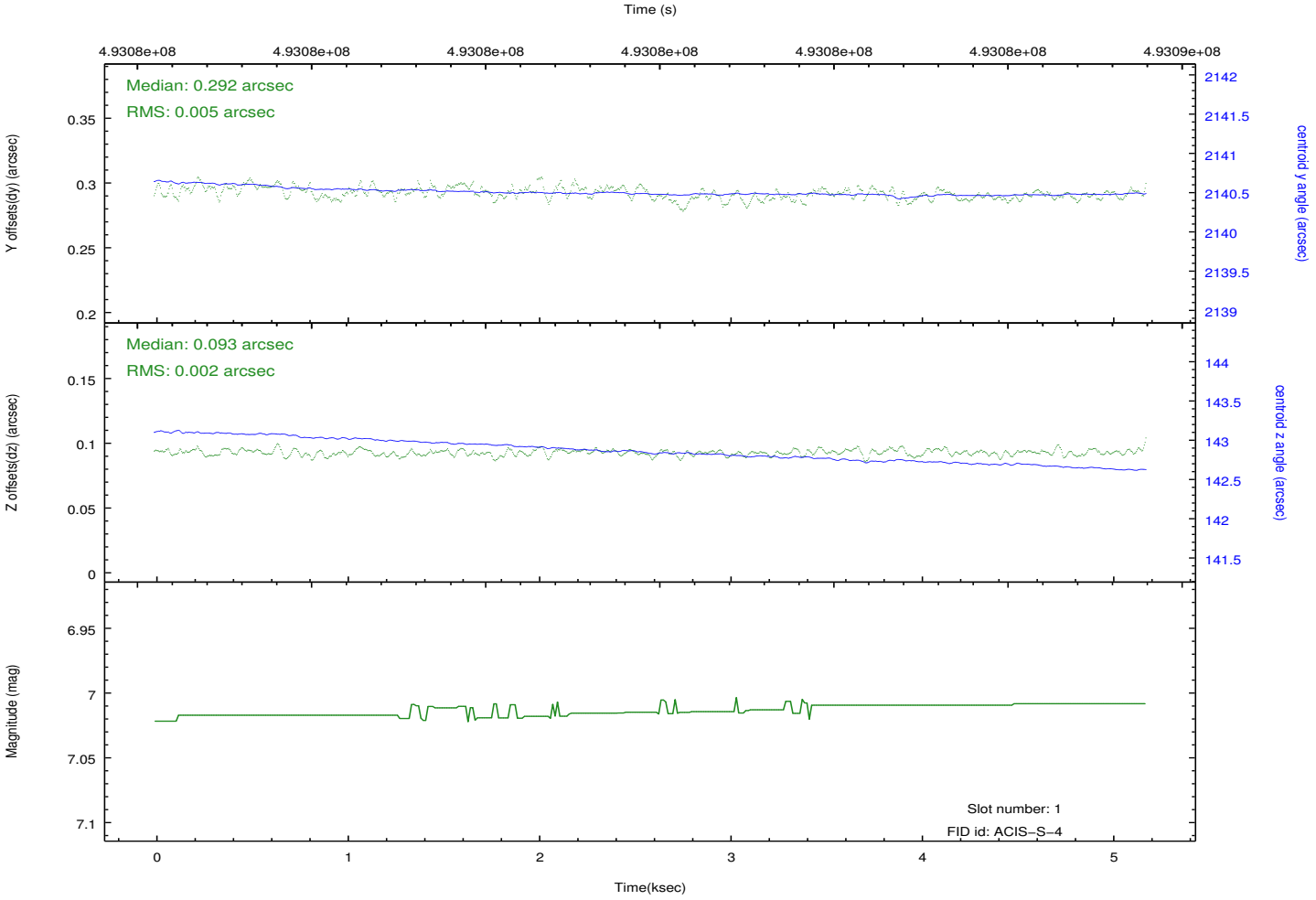




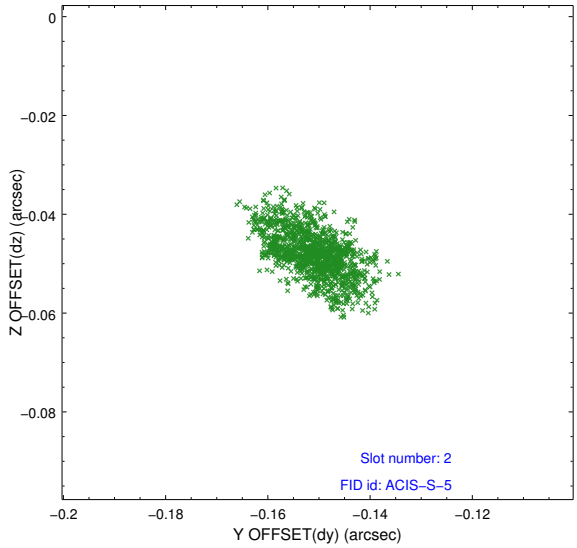
2.5.2 Slot 1

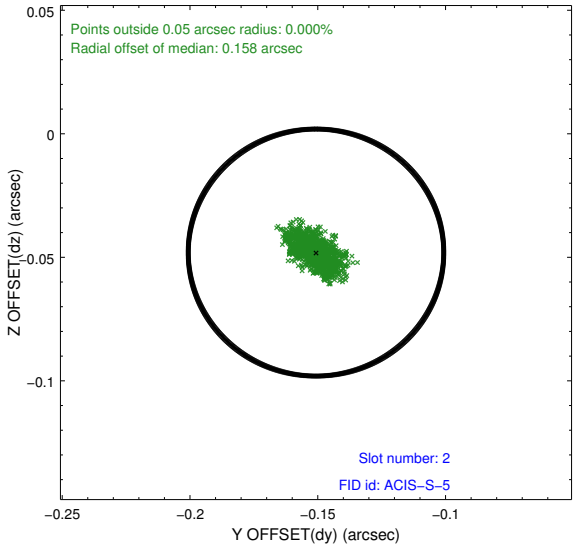

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4

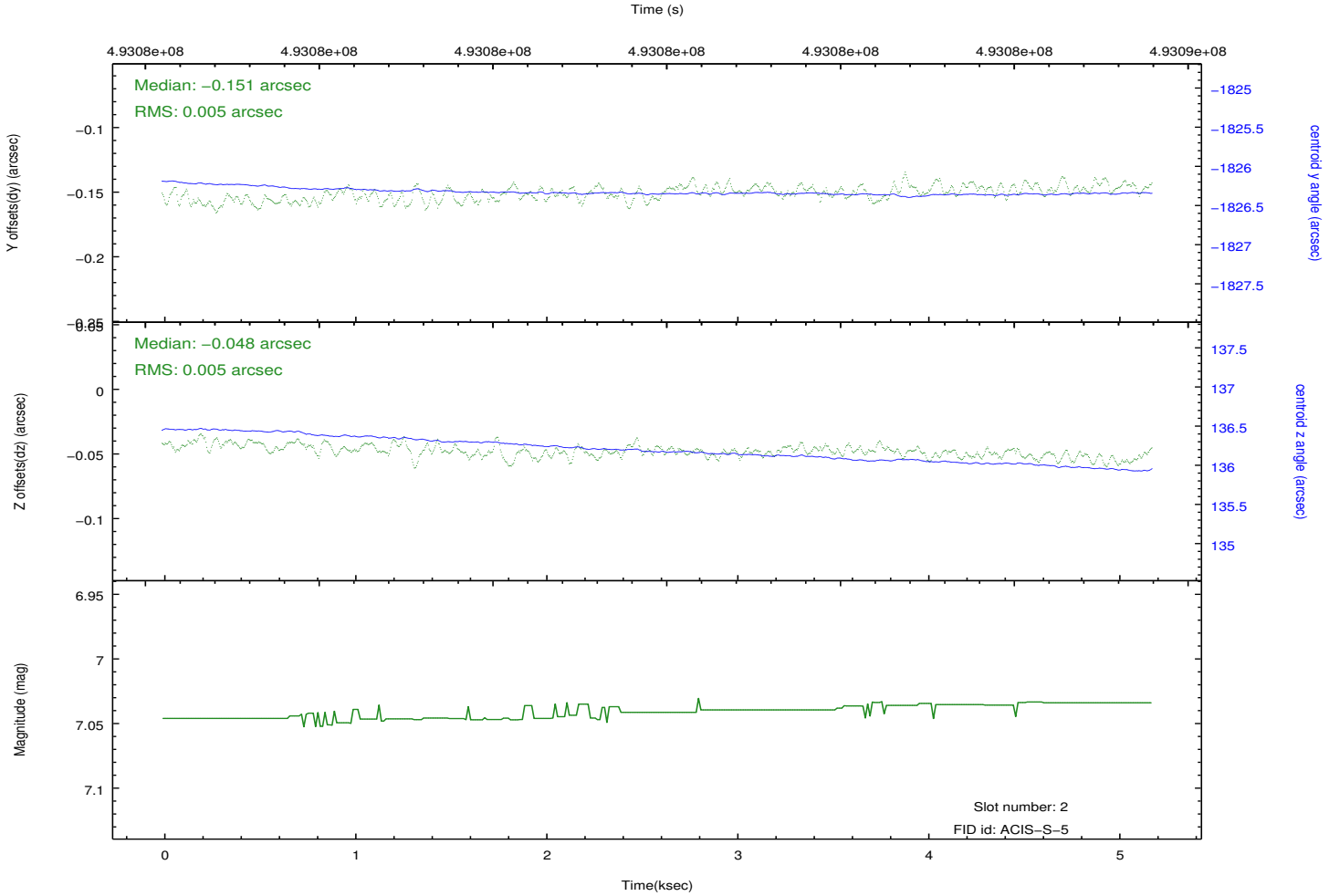

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.306 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4


Time (s)
Median: 0.292 arcsec
RMS: 0.005 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.093 arcsec
RMS: 0.002 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: 0.158 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5


Time (s)
Median: −0.151 arcsec
RMS: 0.005 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: −0.048 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)	2014.12.11
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	3.5637511508465

A.2 Comments

```
Joint proposal 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.
```