V&V Reference Report
L2 ASCDS Version : 8.5.1.1

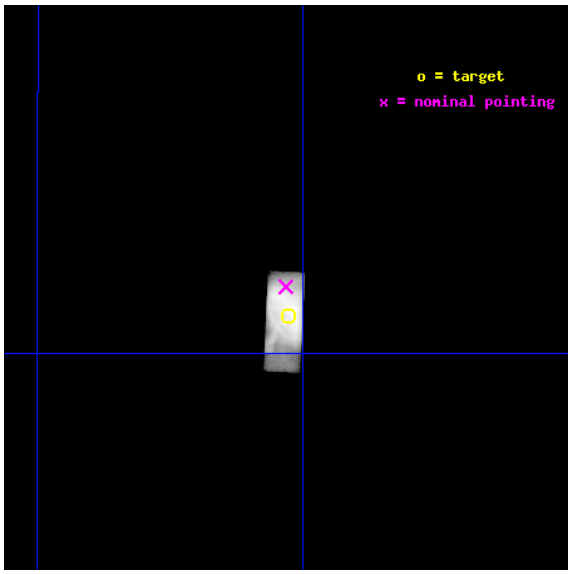
Observation 5555 - L2 Version 4
Chandra X-Ray Center

L2 Processing Date : Dec 29 2012

Contents

1 Front

seq_num	500544	Sequence number
obs_id	5555	Observation id
title	Monitoring of the Relativistic Magnetohydrodynamic Shock in the Crab Nebula	Proposal title
observer	Dr Koji Mori	Principal investigator
object	The Crab Nebula	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	83.632083	Observer's specified target RA [deg]
dec_targ	22.016472	Observer's specified target Dec [deg]
ra_nom	83.633291215531	Nominal RA [deg]
dec_nom	22.028893022935	Nominal Dec [deg]
roll_nom	92.724932374408	Nominal Roll [deg]
revision	4	Processing version of data
ontime	9150.6003636122	Sum of GTIs [s]
livetime	8049.4373360417	Livetime [s]
ontime7	9150.6003636122	Sum of GTIs [s]
l2events	2236779	Number of level 2 events

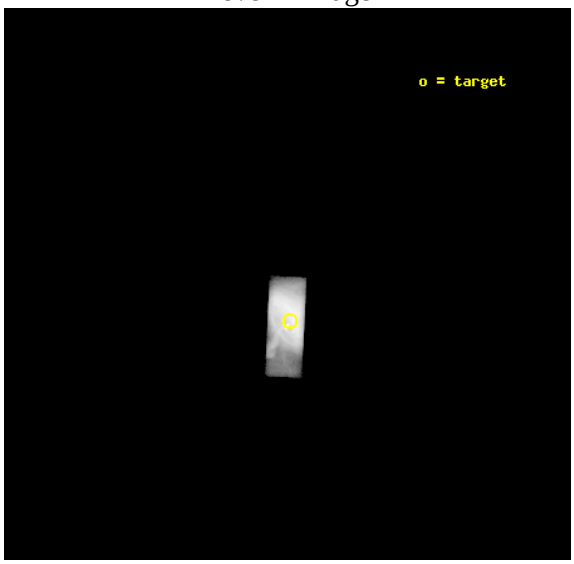


2 OBI

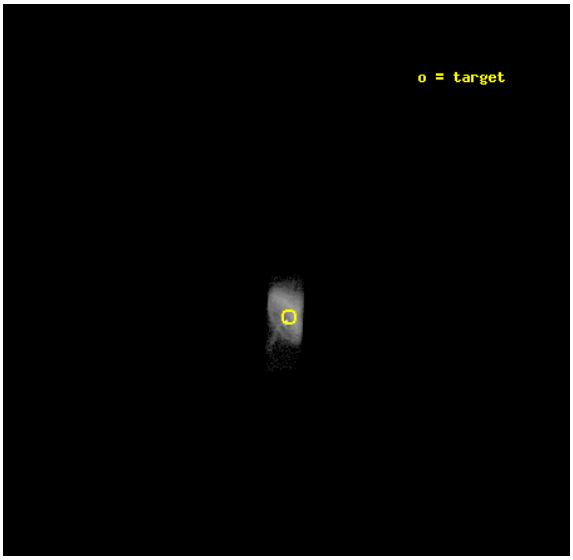
2.1 OBI

2.1.1 Images

Level 1 Image



Level 1 Bad Events



2.1.2 Parameters

obi_num	1	Obi number
ascdsver	8.5.1.1	Processing system revision
caldbver	4.5.5	
date	2012-12-28T22:37:25	Date and time of file creation
revision	4	Processing version of data

sched_exp_time	9000.000000	[s] Scheduled observation exposure time
ontime	9150.6003636122	Sum of GTIs [s]
ontime7	9150.6003636122	Sum of GTIs [s]
l1events	2386572	Number of level 1 events

2.1.3 Events

	ccd 7
level 1 events	2386572
rejected events	114792
rejected %	4%

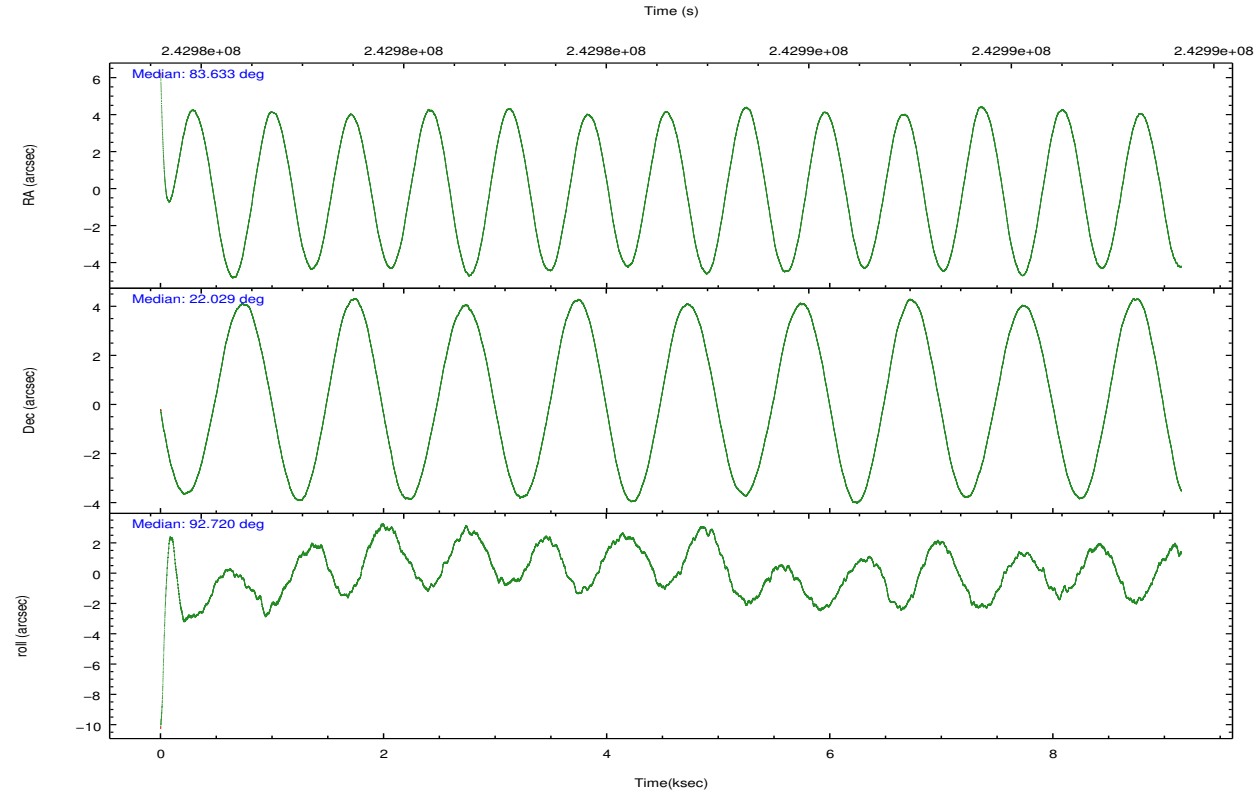
	ccd 7
grade 0 events	463329
	19%
grade 1 events	8569
	0%
grade 2 events	585563
	24%
grade 3 events	261319
	10%
grade 4 events	251272
	10%
grade 5 events	35928
	1%
grade 6 events	738247
	30%
grade 7 events	42345
	1%

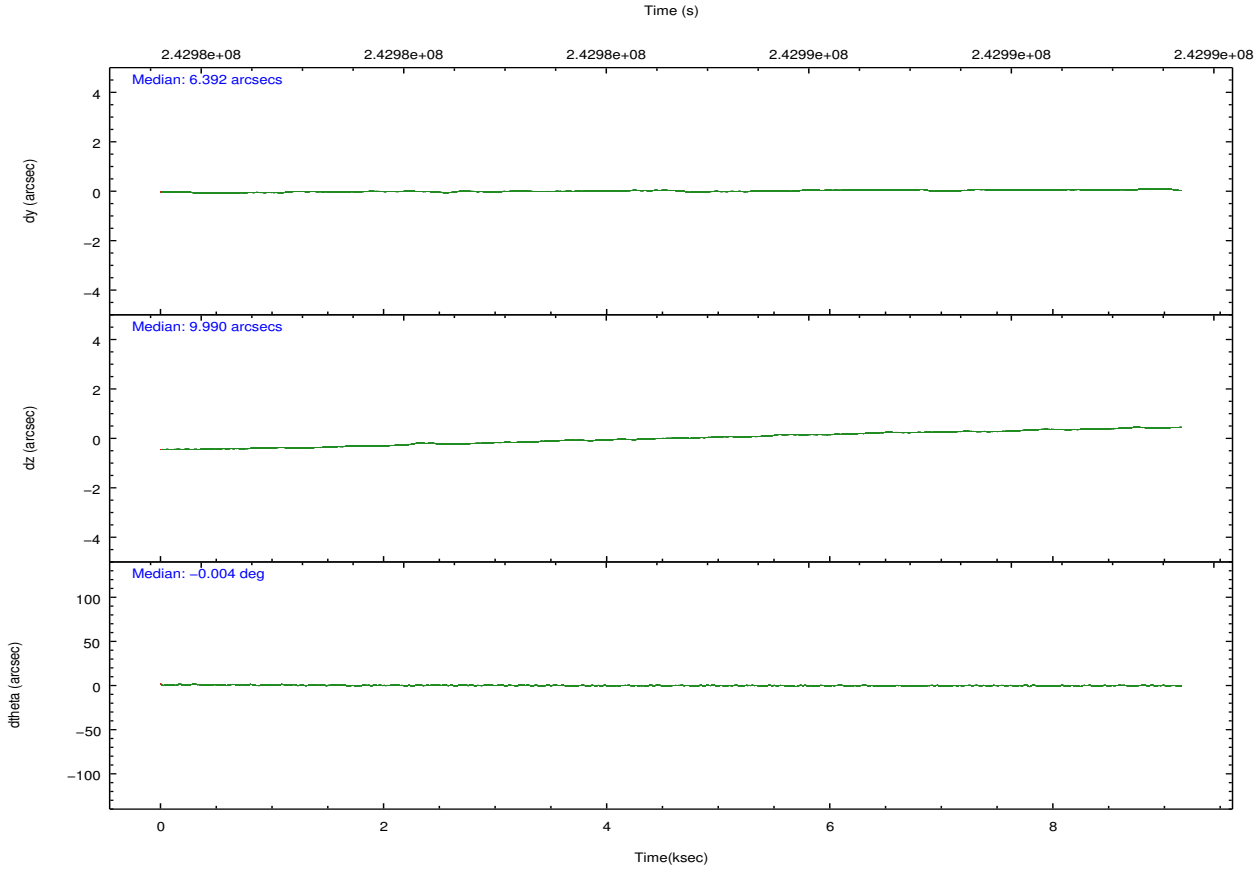
2.2 Compared Parameters

Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-7	ACIS-7
Grating	HETG	HETG
Data mode	GRADED	GRADED
Observation mode	POINTING	POINTING
[deg] Pointing RA	83.649500	83.63329121553136
[deg] Pointing Dec	22.006182	22.02889302293476
[deg] Pointing Roll	92.562239	92.72493237440833
[s] Window start time (MET)	242265664.184000	242265664.184000
[s] Window stop time (MET)	242870464.184000	242870464.184000
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-182.132523	-182.1344861297048
[mm] SIM translation stage offset	-8	-7.998036453302973
[s] Observation start time (MET)	242980217.184000	242979224.87851
Observation start date	2005-09-13T06:29:13	2005-09-13T06:13:44
[s] Observation end time (MET)	242989217.184000	242990221.59151
Observation end date	2005-09-13T08:59:13	2005-09-13T09:17:01
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	127	127
Subarray row count	101	101
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	0.3

2.3 Aspect


Time (s)
2.4298e+08
2.4298e+08
2.4298e+08
2.4299e+08
2.4299e+08
2.4299e+08
Median: 83.633 deg
RA (arcsec)
Median: 22.029 deg
Dec (arcsec)
Median: 92.720 deg
roll (arcsec)
Time(ksec)

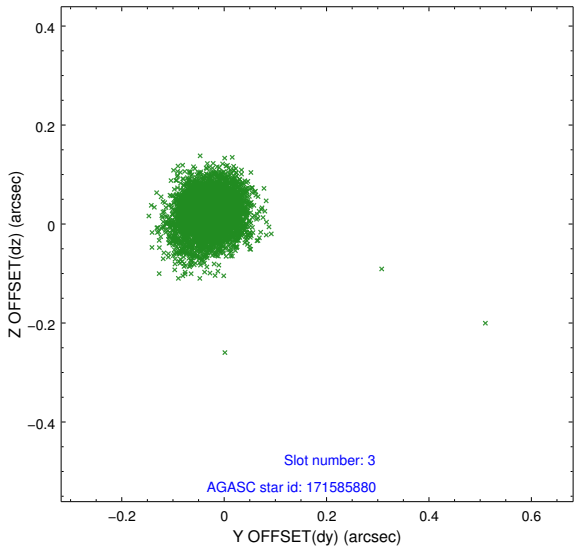

Time (s)
2.4298e+08
2.4298e+08
2.4298e+08
2.4299e+08
2.4299e+08
2.4299e+08
Median: 6.392 arcsecs
dy (arcsec)
Median: 9.990 arcsecs
dz (arcsec)
Median: −0.004 deg
dtheta (arcsec)
Time(ksec)

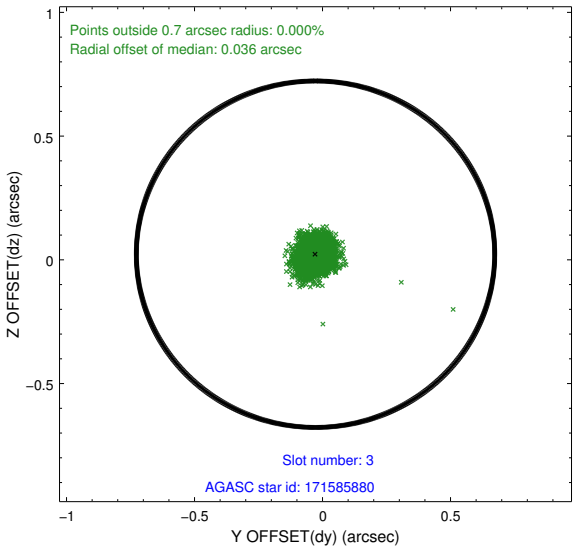
Slot Statistics

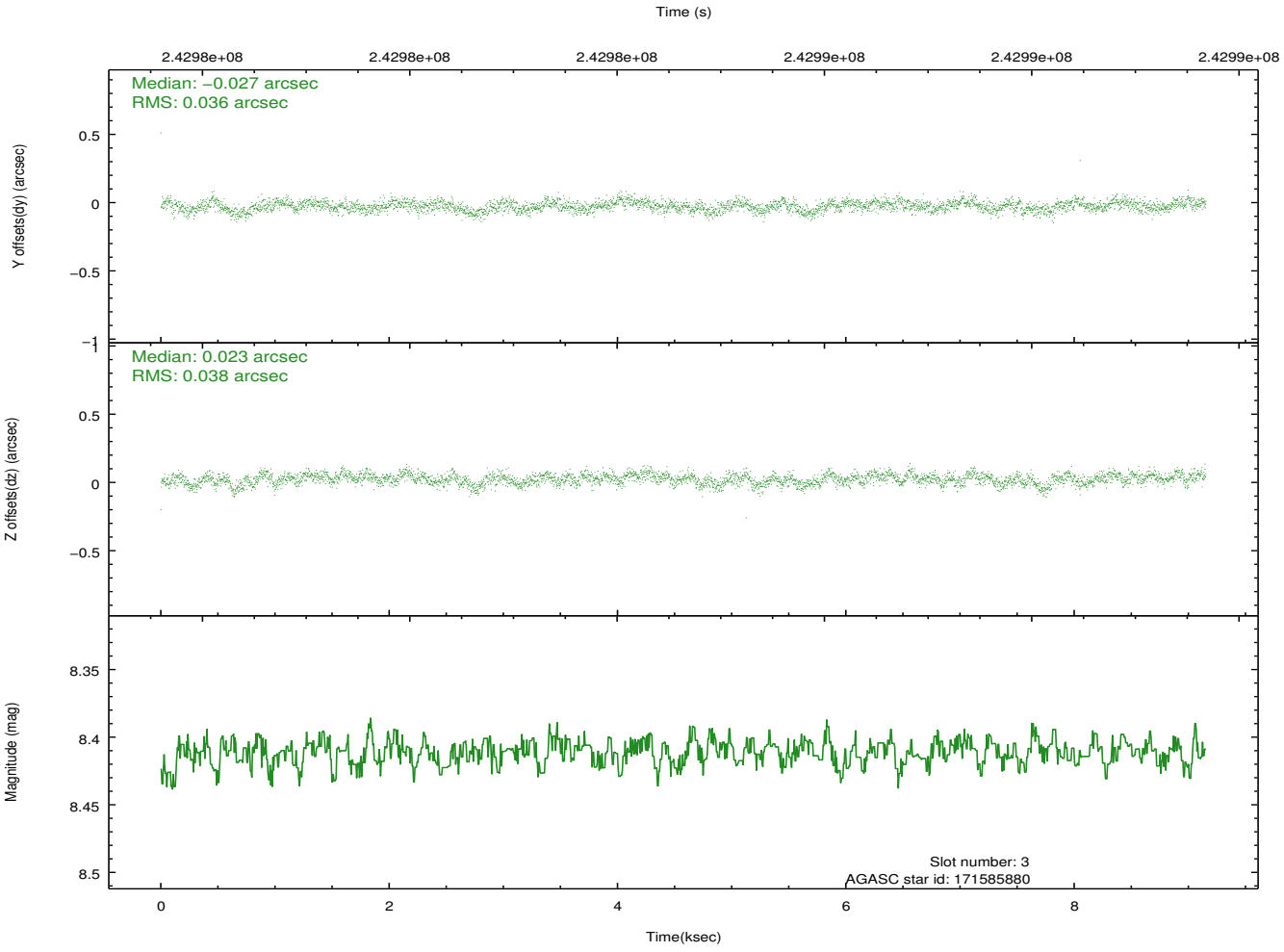
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	7.09	2233	-0.089	-0.099	0.007	0.013	0.000000	0.000000	-758.65	-1896.10
1	FID	ACIS-S-4	7.18	2233	0.152	0.070	0.006	0.011	0.000000	0.000000	2154.60	11.85
2	FID	ACIS-S-5	7.22	2233	-0.094	0.038	0.008	0.013	0.000000	0.000000	-1810.73	6.17
3	GUIDE	171585880	8.41	4462	-0.027	0.023	0.054	0.089	83.676260	22.176319	608.23	-116.19
4	GUIDE	171586032	8.93	4464	-0.034	0.060	0.063	0.102	83.950197	22.083225	233.75	-1014.24
5	GUIDE	171597832	9.16	4462	0.312	-0.265	0.078	0.127	83.183230	21.366702	-2227.06	1664.13
6	GUIDE	171721904	9.19	4464	-0.073	0.118	0.079	0.131	84.272676	22.116922	309.54	-2093.52
7	GUIDE	243941560	8.29	4463	-0.176	0.065	0.064	0.102	83.733264	22.568598	2010.47	-368.63

2.4 Star Slots

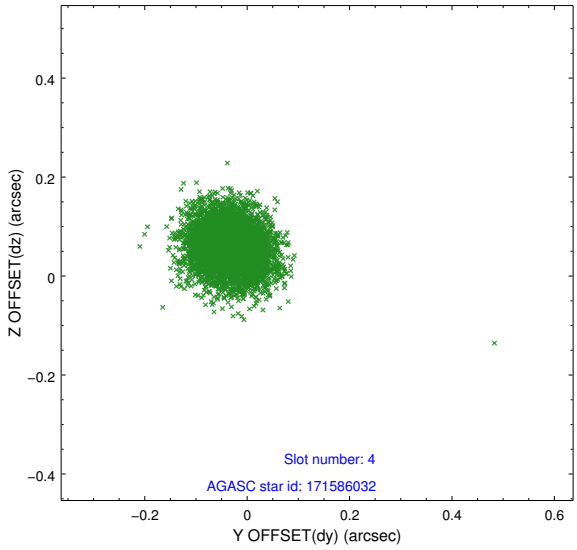
2.4.1 Slot 3

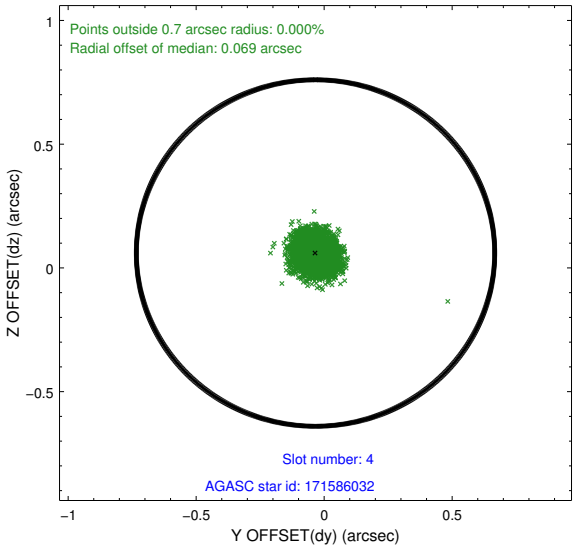


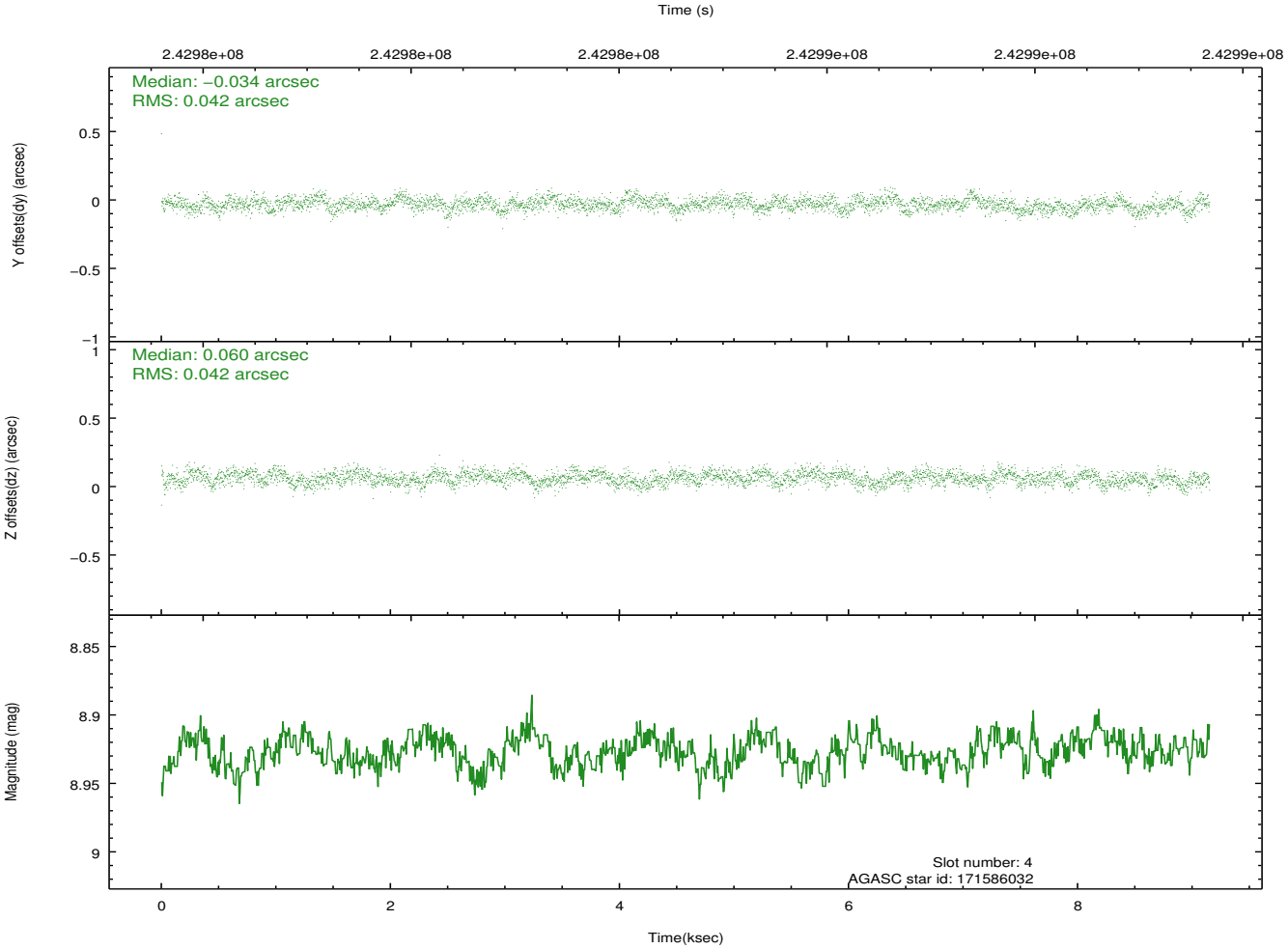




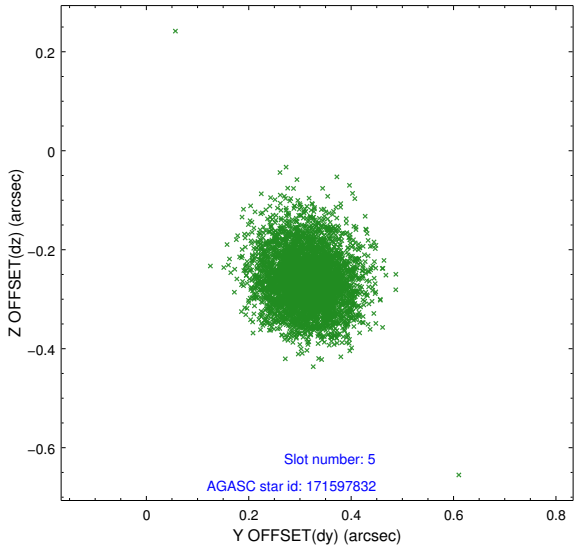
2.4.2 Slot 4

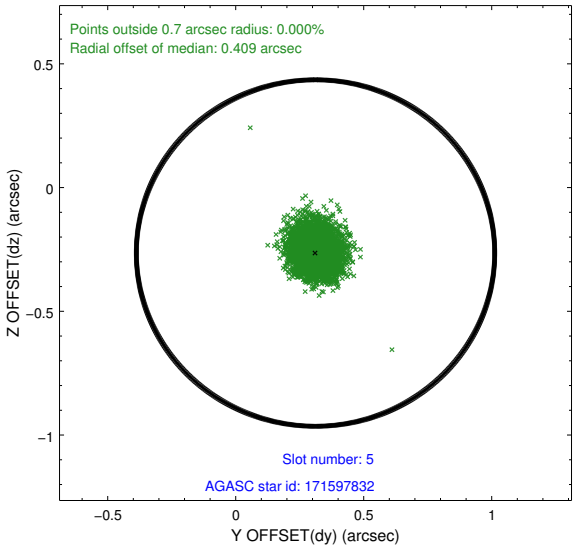

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 171586032

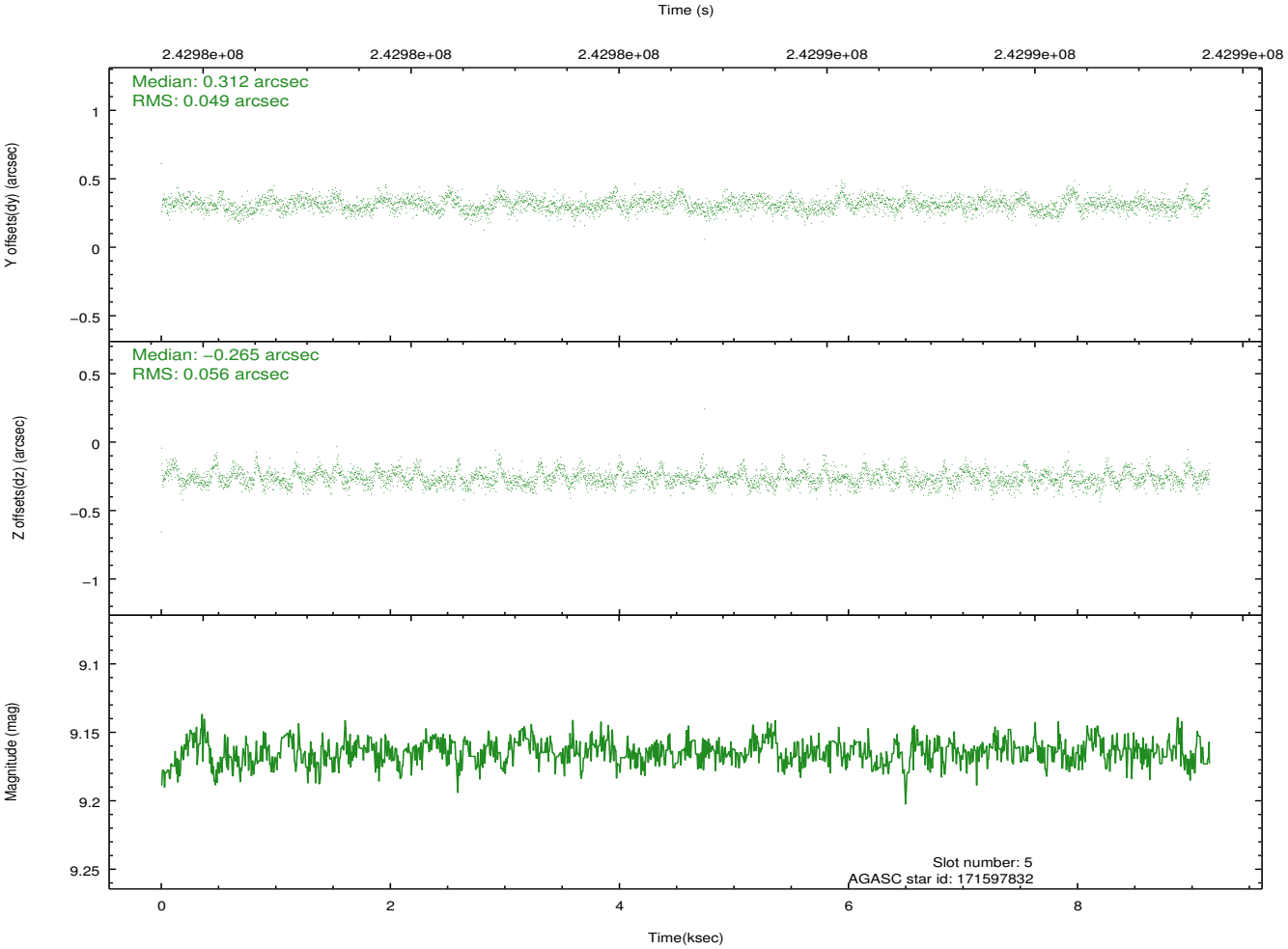

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.069 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 171586032


Time (s)
Median: −0.034 arcsec
RMS: 0.042 arcsec
Y offsets(dy) (arcsec)
Median: 0.060 arcsec
RMS: 0.042 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 171586032
Time(ksec)

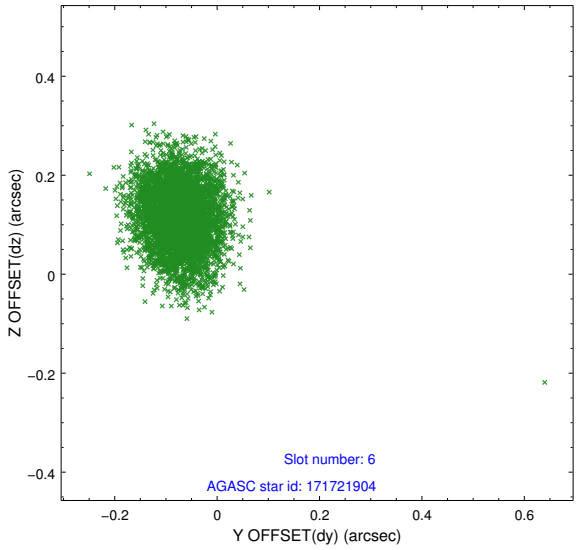
2.4.3 Slot 5

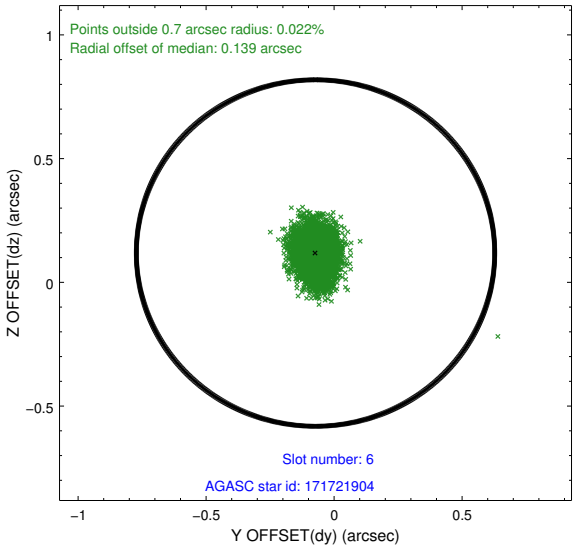

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 171597832

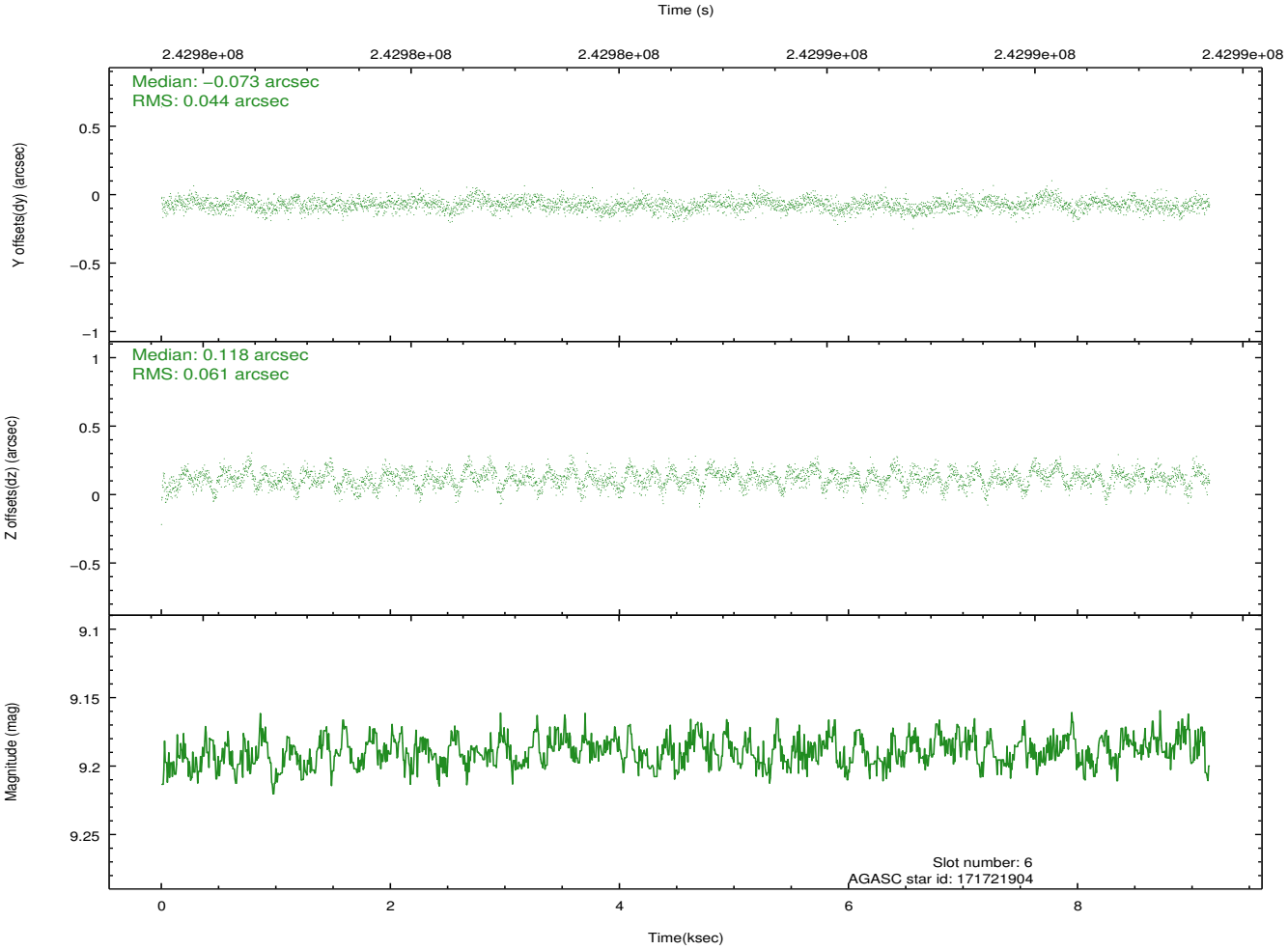

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.409 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 171597832


Time (s)
Median: 0.312 arcsec
RMS: 0.049 arcsec
Y offsets(dy) (arcsec)
Median: −0.265 arcsec
RMS: 0.056 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 171597832
Time(ksec)

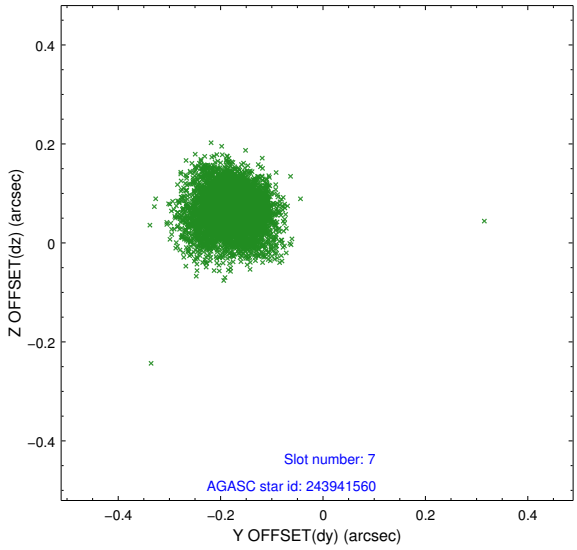
2.4.4 Slot 6

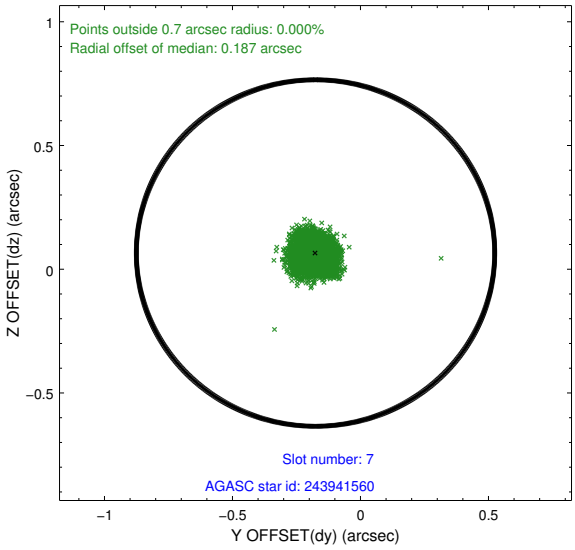

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 171721904

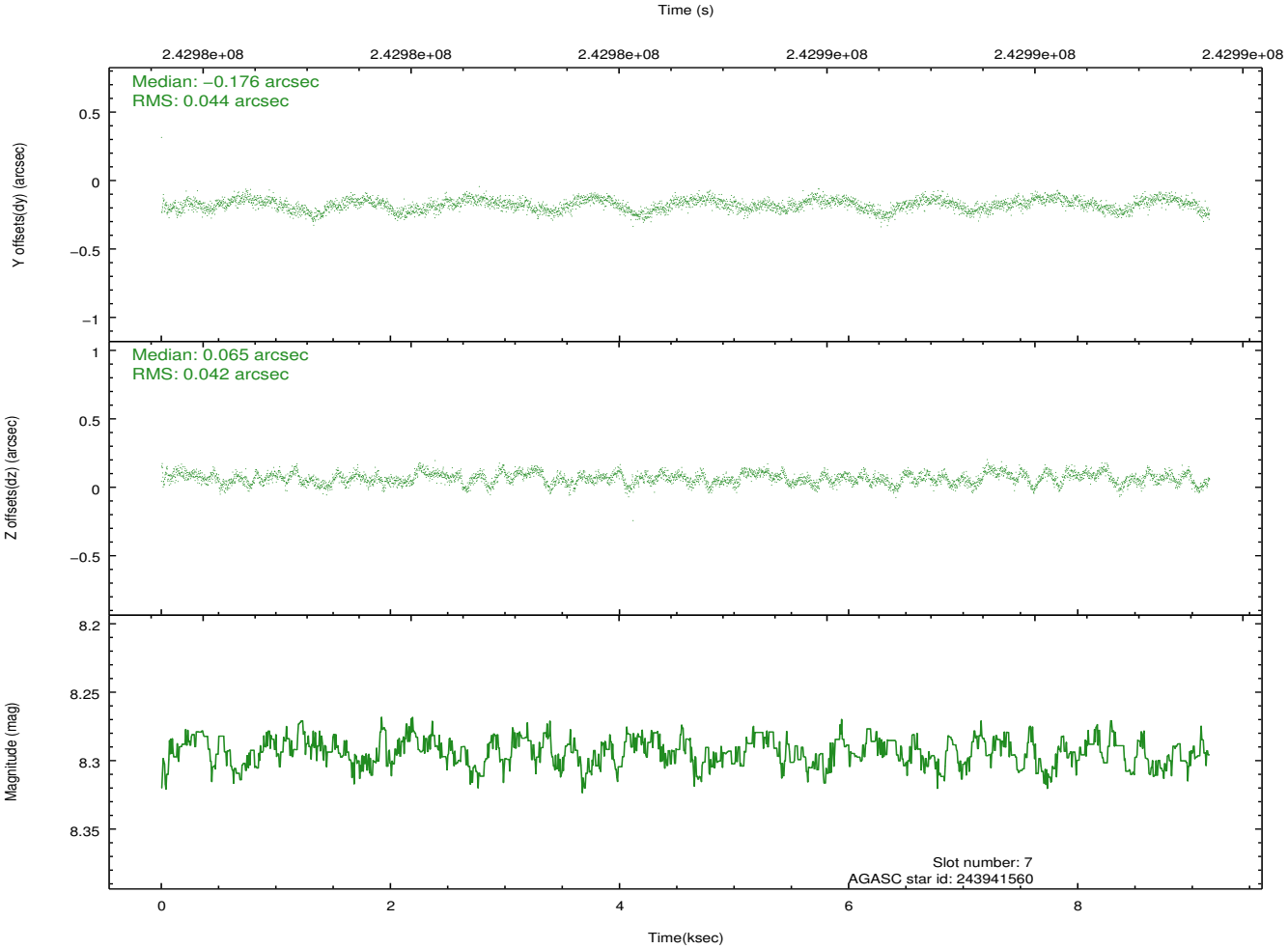

Points outside 0.7 arcsec radius: 0.022%
Radial offset of median: 0.139 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 171721904


Time (s)
Median: −0.073 arcsec
RMS: 0.044 arcsec
Y offsets(dy) (arcsec)
Median: 0.118 arcsec
RMS: 0.061 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 171721904
Time(ksec)

2.4.5 Slot 7

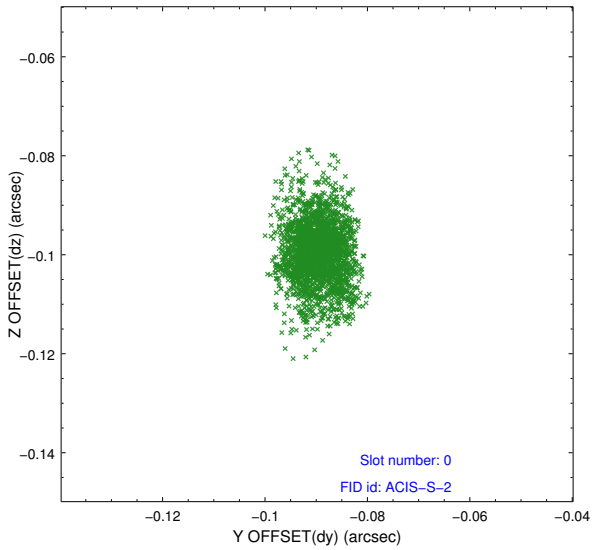

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 243941560

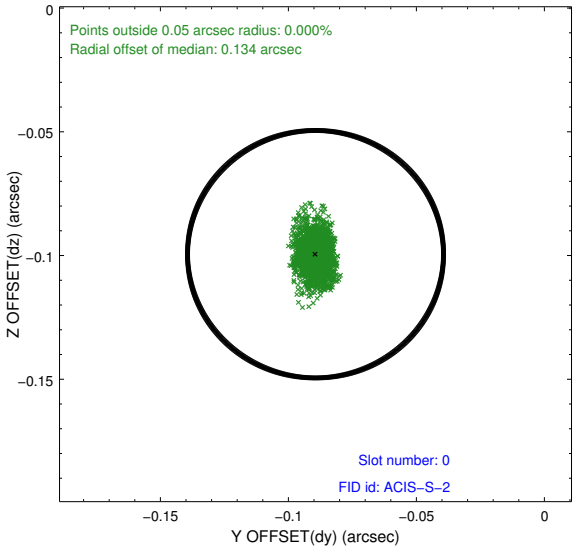

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.187 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 243941560

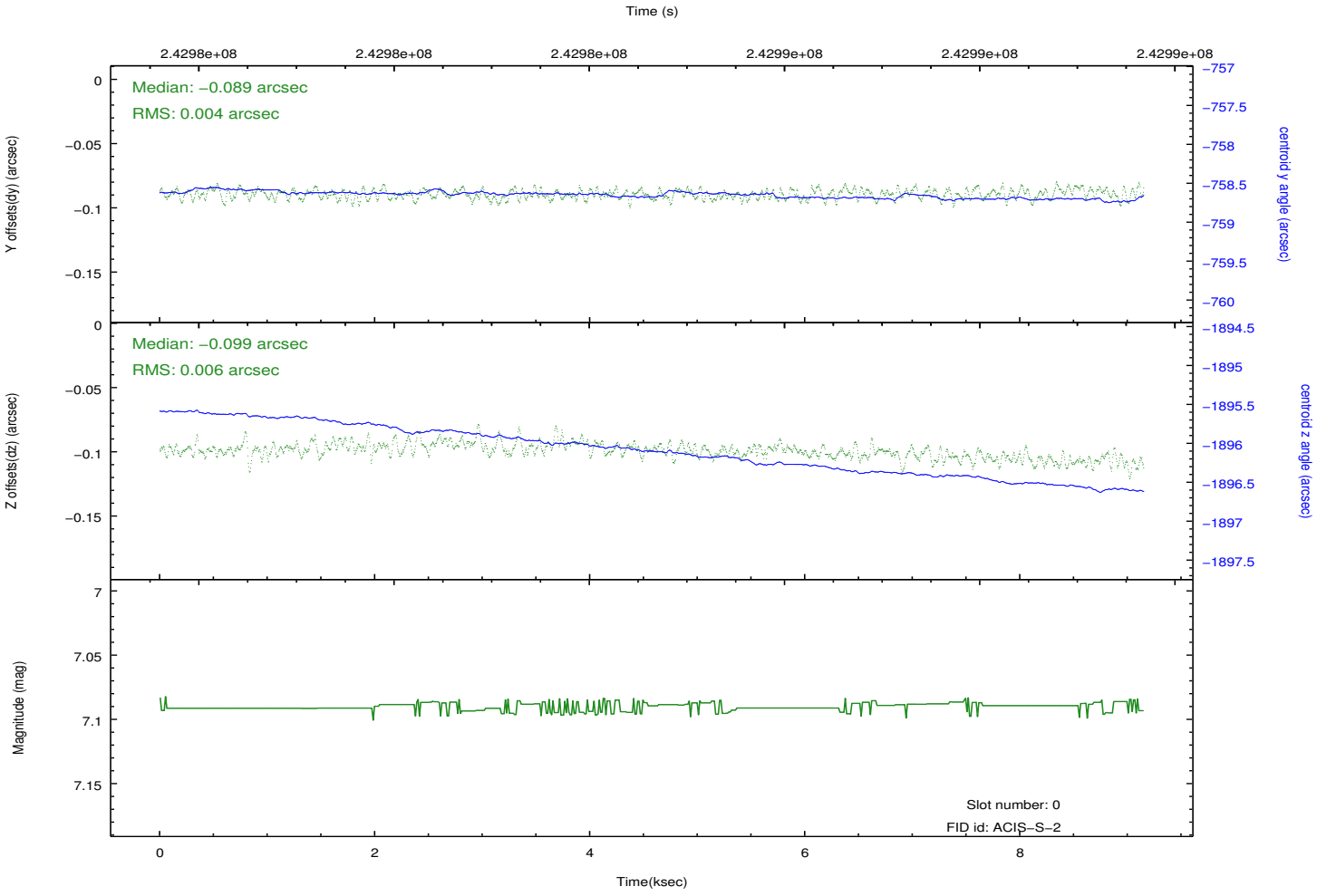

Time (s)
Median: −0.176 arcsec
RMS: 0.044 arcsec
Y offsets(dy) (arcsec)
Median: 0.065 arcsec
RMS: 0.042 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 243941560
Time(ksec)

2.5 FID Slots

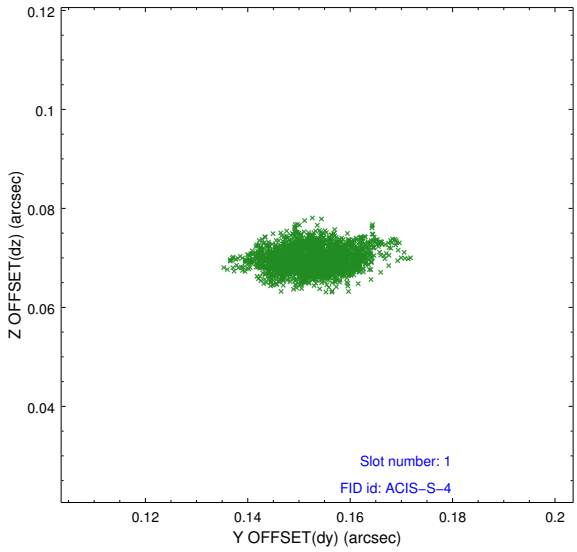
2.5.1 Slot 0

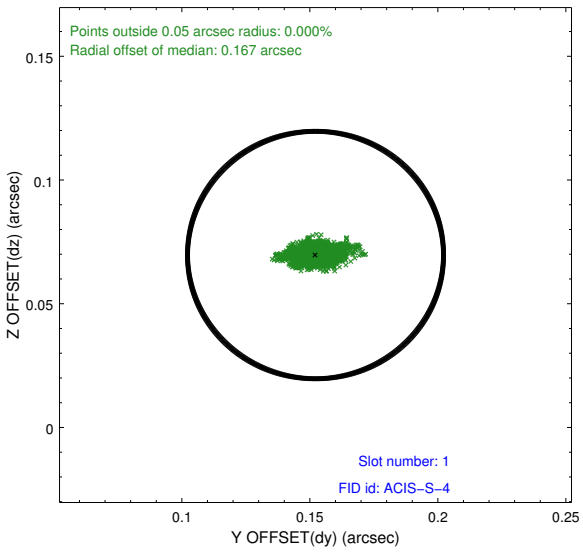


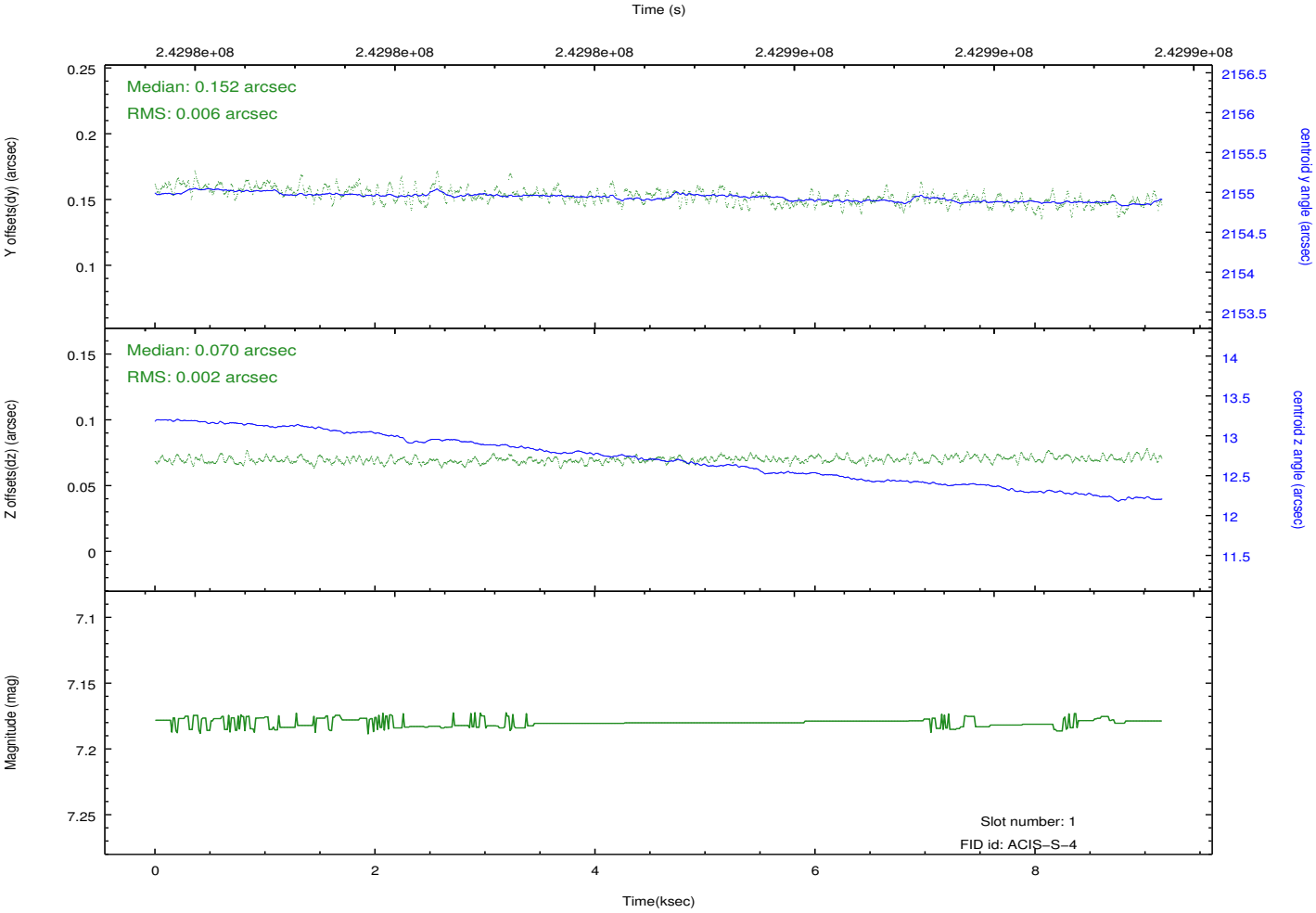




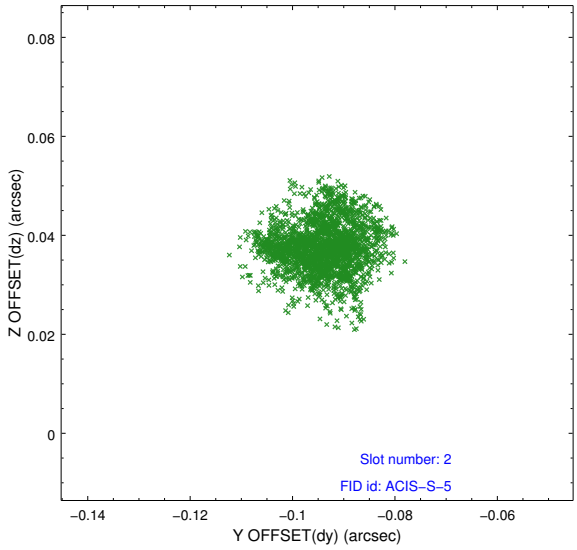
2.5.2 Slot 1

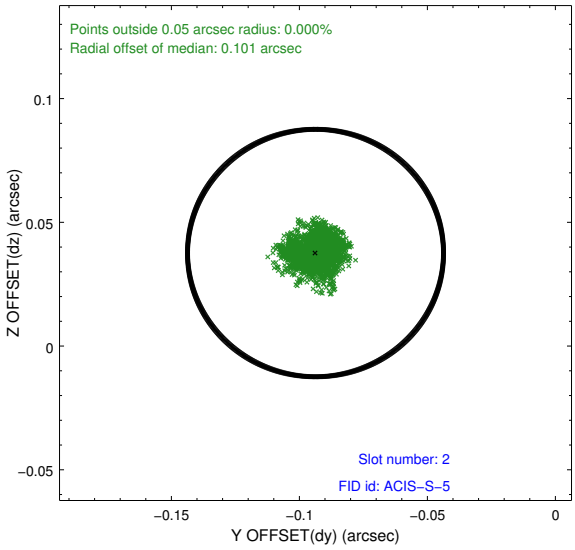

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4

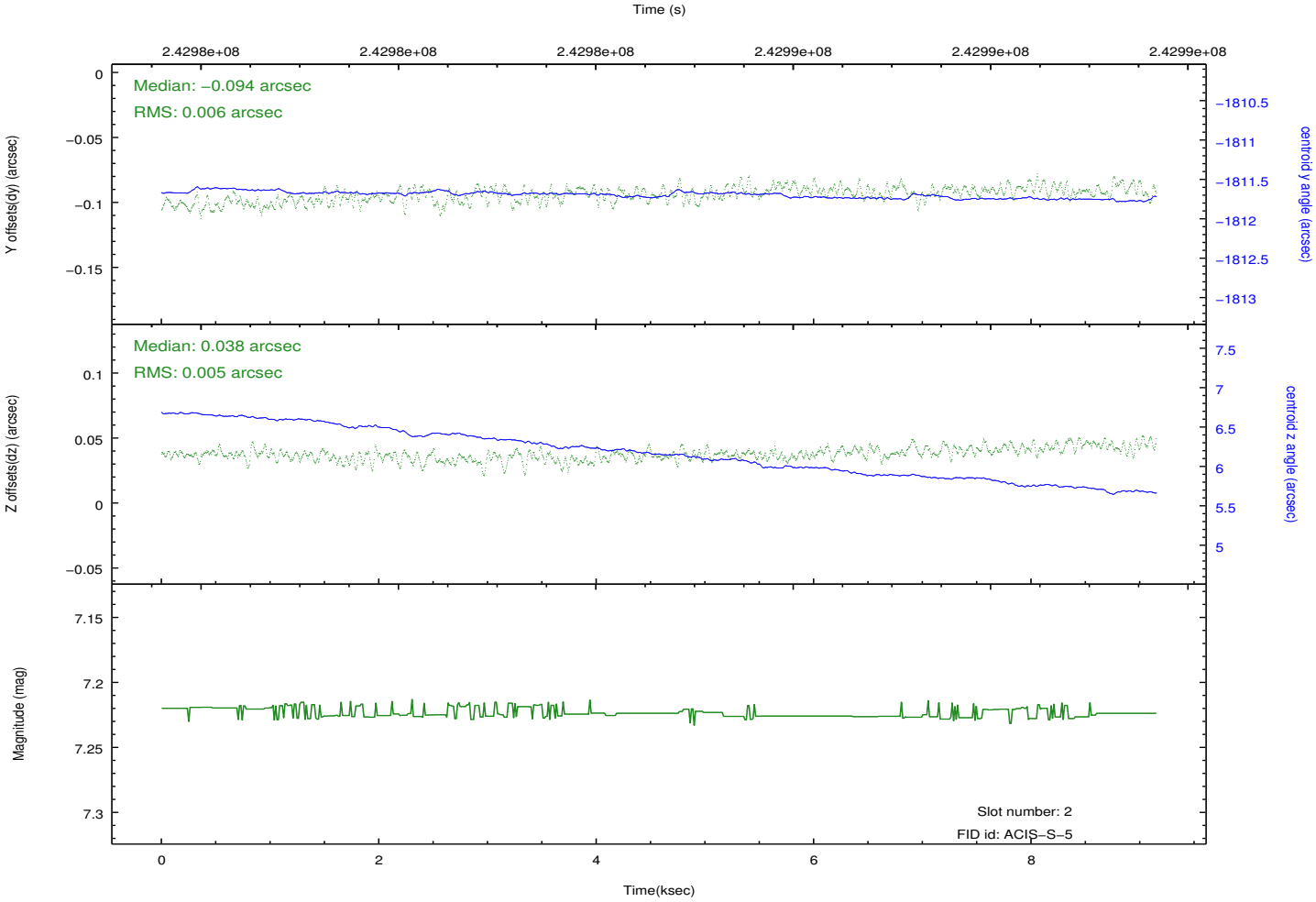

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.167 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4


Time (s)
Median: 0.152 arcsec
RMS: 0.006 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.070 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

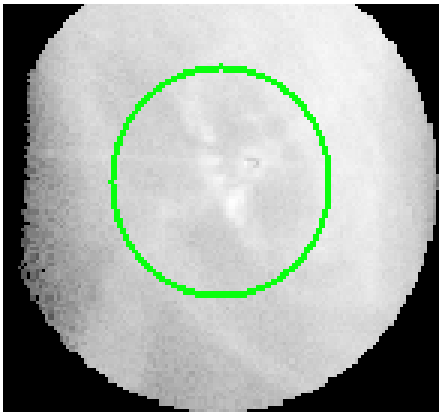

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.101 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5


Time (s)
Median: −0.094 arcsec
RMS: 0.006 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.038 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)

3 Gratings

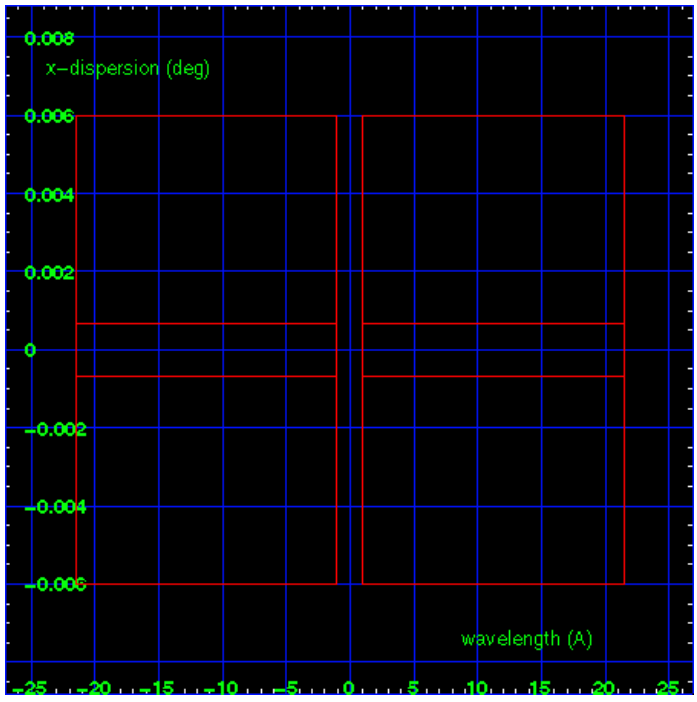
3.1 HEG Arm

HEG Order Sort 123

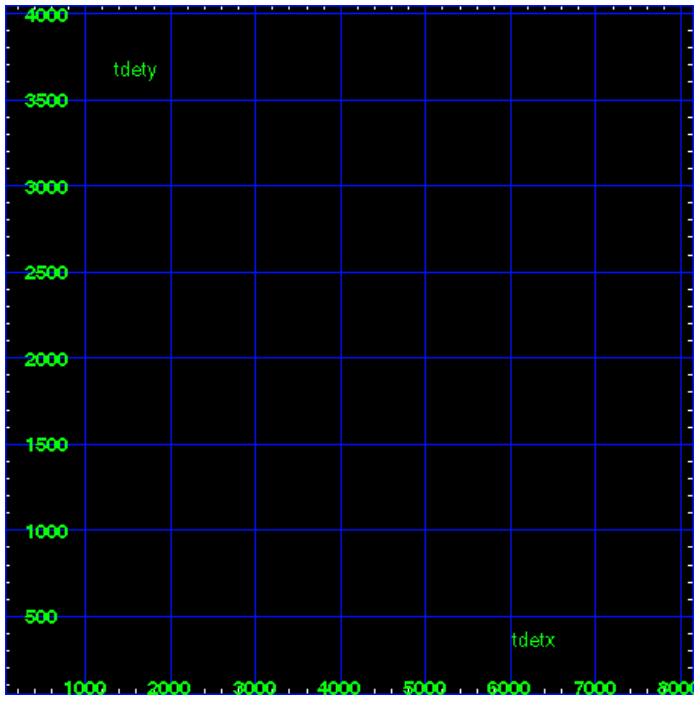


HEG Zero Order

HEG Order Sort ALL

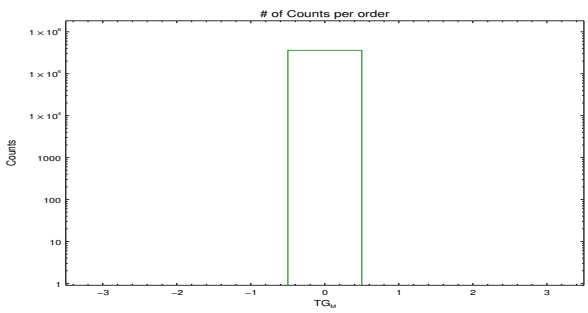


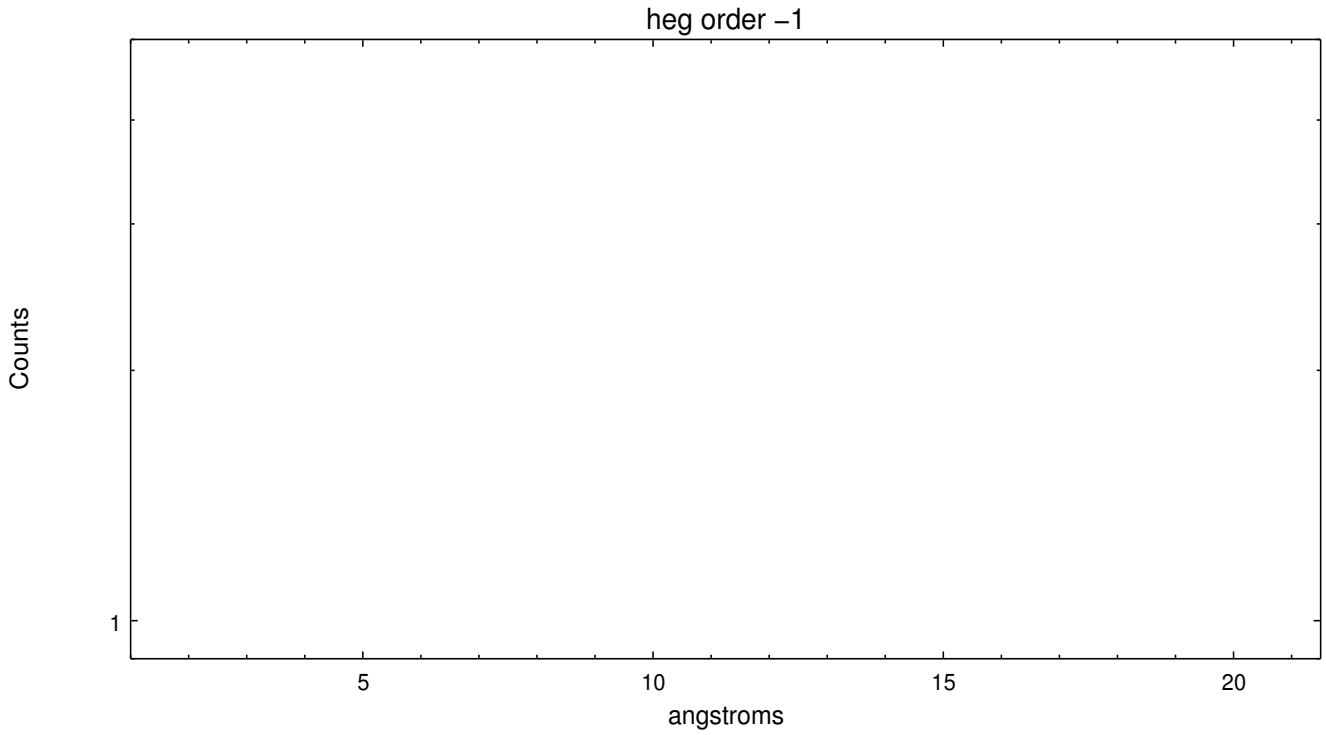
Spot Image HEG

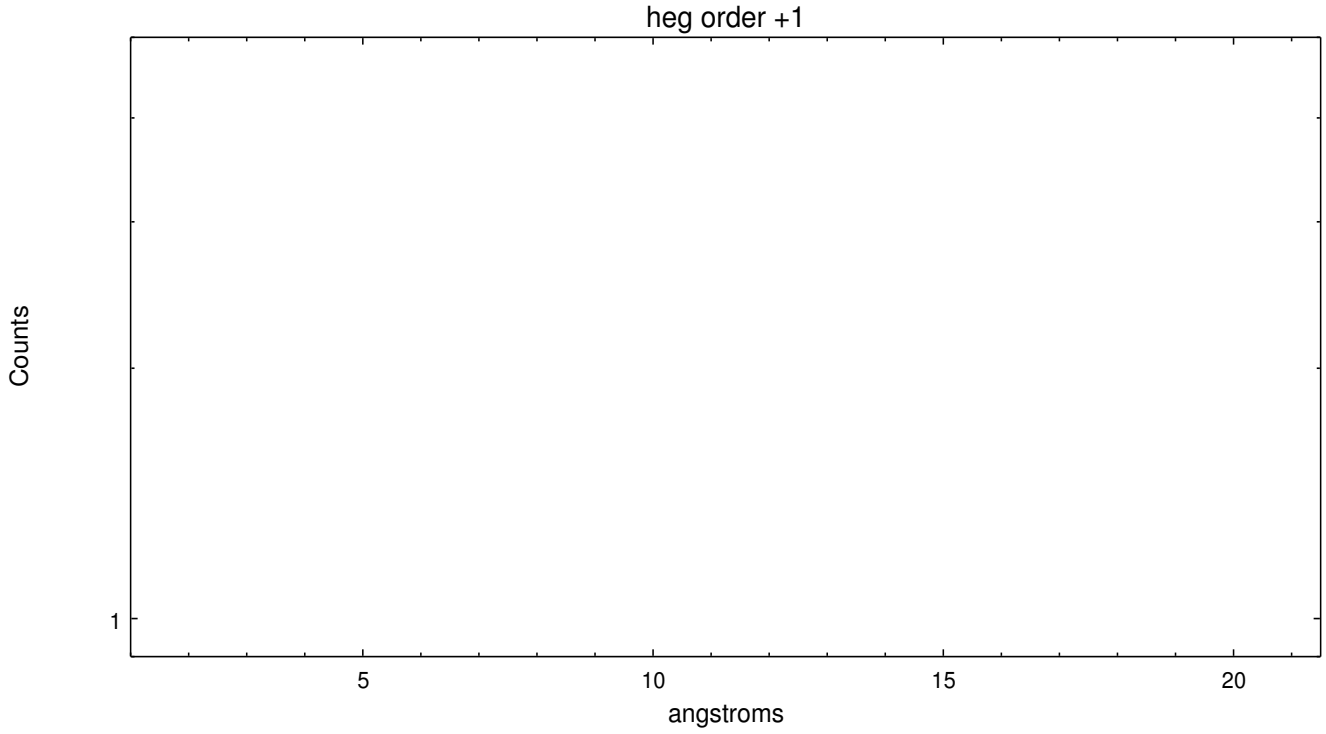


Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	0	0	0	365921	0	0	0

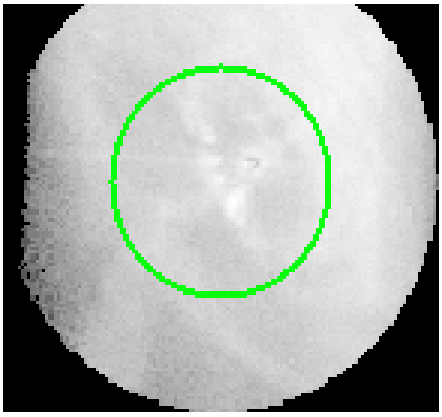



heg order −1
Counts
1
5
10
15
20
angstroms


heg order +1
Counts
1
5
10
15
20
angstroms

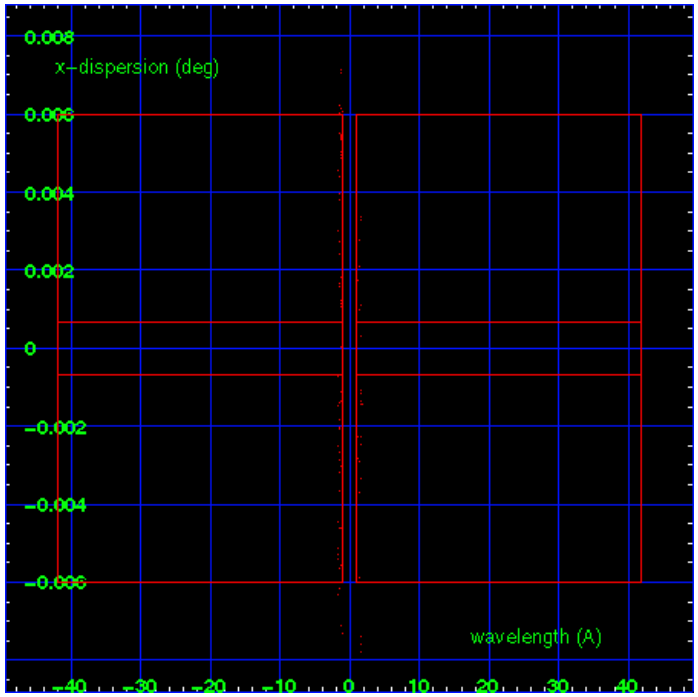
3.2 MEG Arm

MEG Order Sort 123

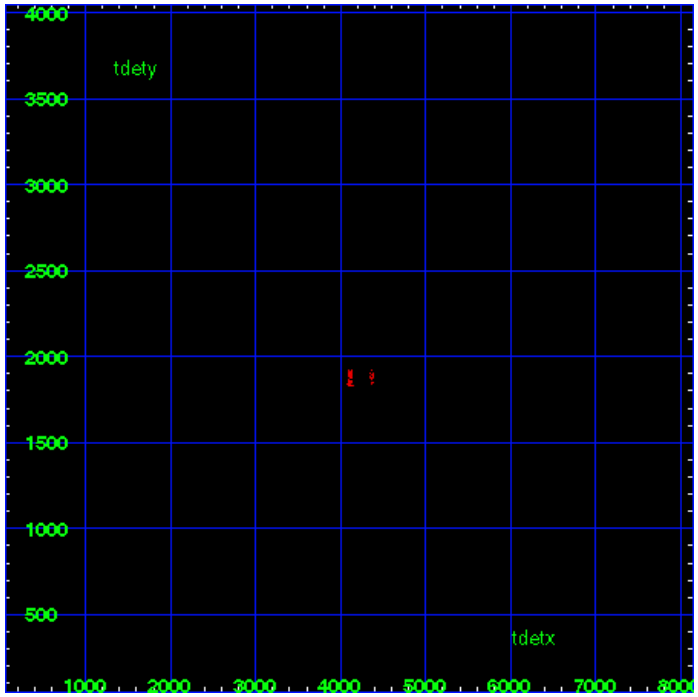


MEG Zero Order

MEG Order Sort ALL

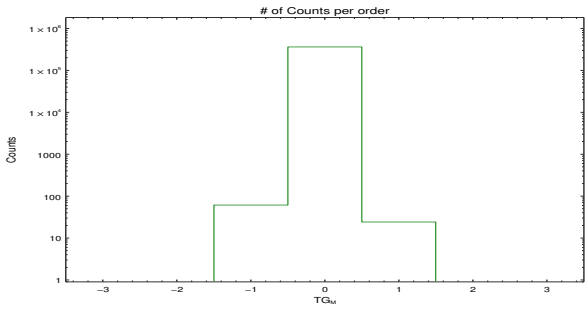


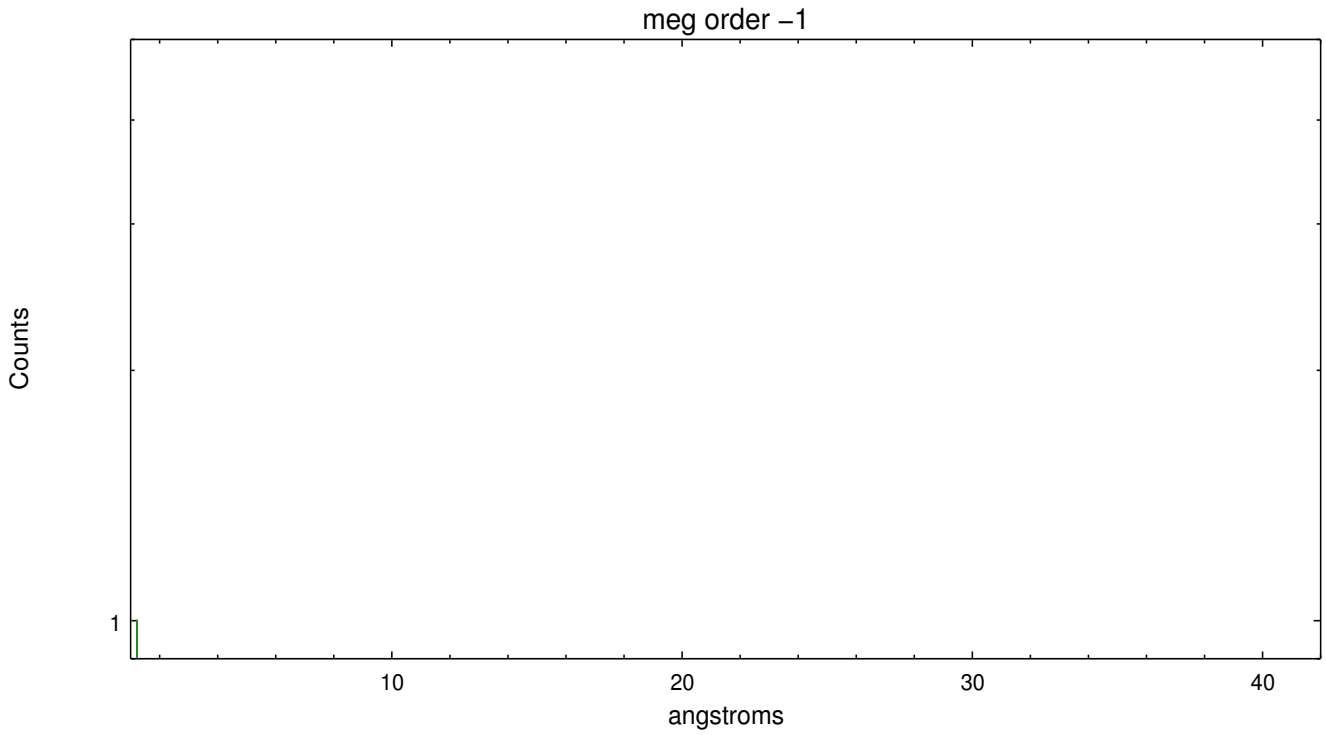
Spot Image MEG

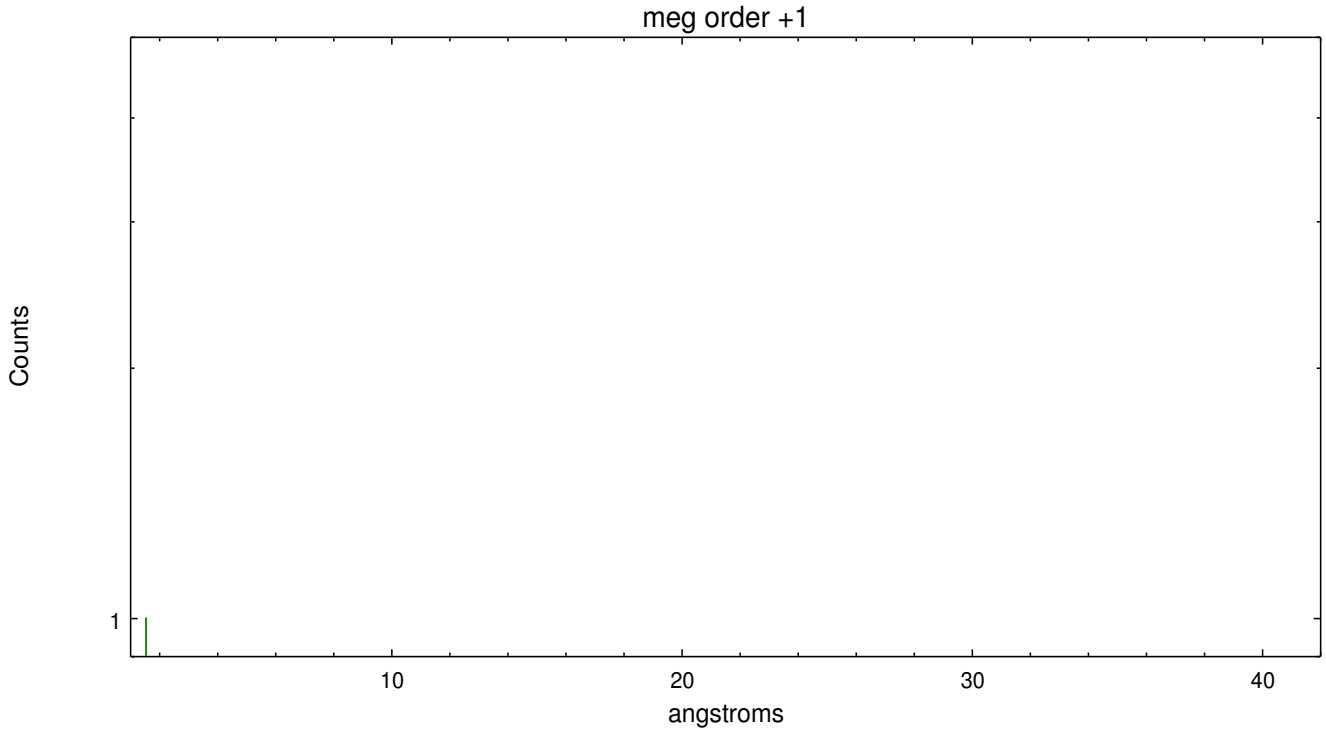


Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	0	0	61	365921	24	0	0




meg order −1
Counts
1
10
20
30
40
angstroms


meg order +1
Counts
1
10
20
30
40
angstroms

A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2013.01.23
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	9.1506

A.2 Comments

HETG is inserted as a filter; there is very little useful gratings information in the observation. The zeroth order position used in the grating extraction is NOT at the position of the pulsar, but is near a bright emission knot to the SE. If the dispersed grating spectrum is to be analyzed, it should be re-extracted using the exact position of the pulsar as the zeroth order position. The dispersed spectrum only contains data for the meg +1 order between 1-2 A. Broad east/west streak in Level 2 data is instrumental, due to the fact that the spacecraft dither during this observation was only 1 arcsec.