V&V Reference Report
L2 ASCDS Version : 7.6.9

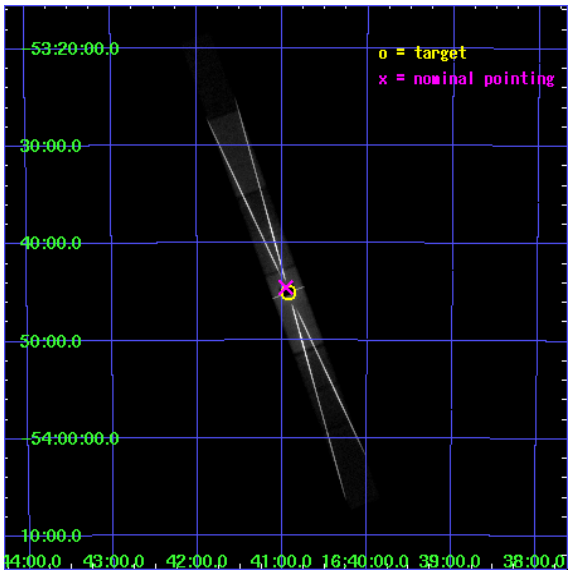
Observation 1939 - L2 Version 002
Chandra X-Ray Center

L2 Processing Date : Jan 23 2007

Contents

1 Front

seq_num	400152
obs_id	1939
title	HIGH RESOLUTION SPECTROSCOPY OF THE X-RAY BURSTER 4U 1636-53
observer	Dr. Norbert Schulz
object	4U 1636-53
dtycycle	0
cycle	P
ra_targ	250.23125
dec_targ	-53.751389
ra_nom	250.23970869766
dec_nom	-53.742955296962
roll_nom	69.623922331992
revision	3
ontime	27061.959125072
livetime	26291.249913327
ontime4	27063.400115222
ontime5	27063.400115222
ontime6	27063.400115222
ontime7	27061.959125072
ontime8	27063.400115222
ontime9	27063.400115222
l2events	2447984

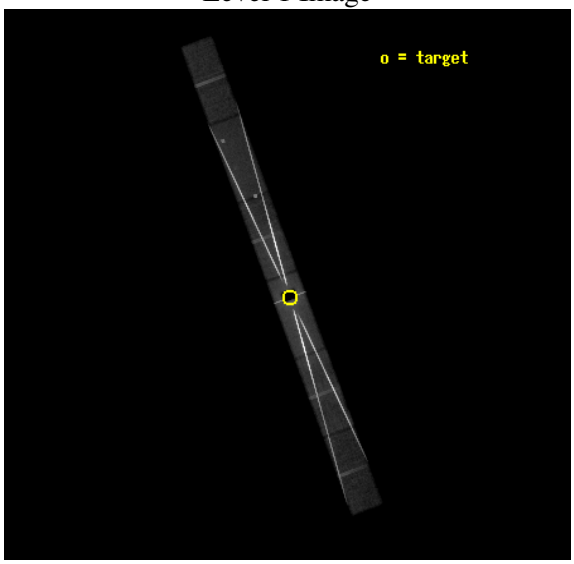


2 OBI

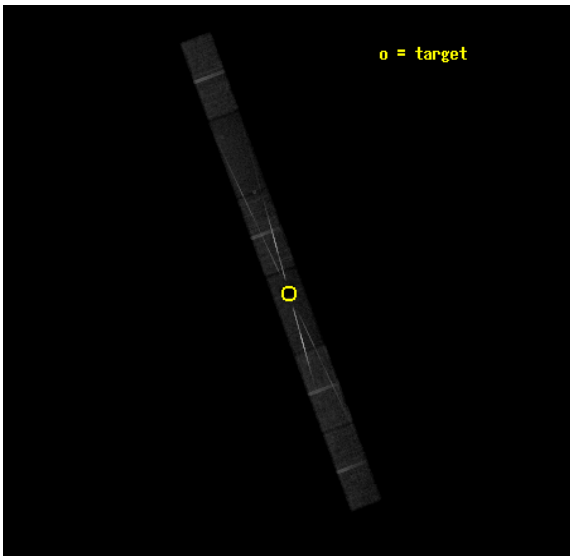
2.1 OBI

2.1.1 Images

Level 1 Image

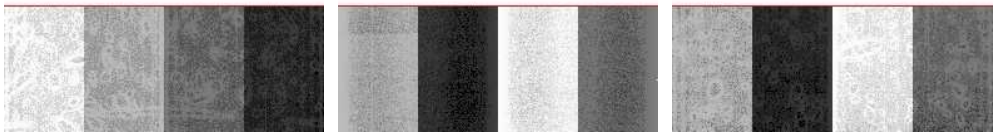


Level 1 Bad Events

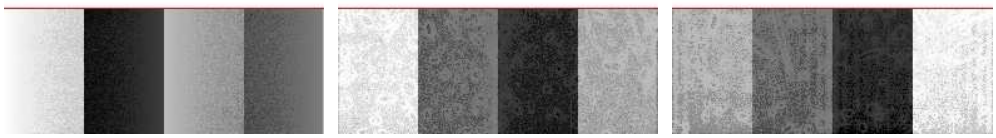


2.1.2 Bias

Chip 4 Chip 5 Chip 6



Chip 7 Chip 8 Chip 9



2.1.3 Parameters

obi_num	0
ascdsver	7.6.9
caldbver	3.2.4
date	2006-11-16T01:31:26
revision	2

sched_exp_time	27000.000000
ontime	27061.959125072
ontime4	27063.400115222
ontime5	27063.400115222
ontime6	27063.400115222
ontime7	27061.959125072
ontime8	27063.400115222
ontime9	27063.400115222
l1events	3164538

2.1.4 Events

	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	103262	321676	1060120	919644	617054	142782
rejected events	90317	70708	120533	107848	107707	78523
rejected %	87%	21%	11%	11%	17%	54%

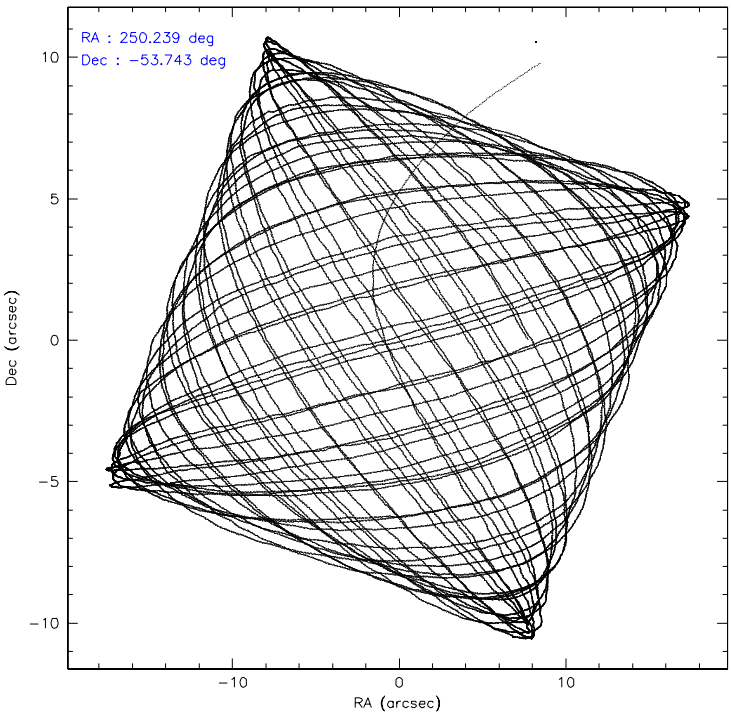
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
grade 0 events	12587	77091	726159	152975	413296	54364
	12%	23%	68%	16%	66%	38%
grade 1 events	56	680	14821	3850	4604	175
	0%	0%	1%	0%	0%	0%
grade 2 events	4477	84441	115599	215058	56785	9823
	4%	26%	10%	23%	9%	6%
grade 3 events	2016	21490	40811	85888	19818	3654
	1%	6%	3%	9%	3%	2%
grade 4 events	1931	21291	40397	84787	19348	3579
	1%	6%	3%	9%	3%	2%
grade 5 events	2401	8228	12119	24406	5888	2901
	2%	2%	1%	2%	0%	2%
grade 6 events	3151	59272	35739	290516	16524	4675
	3%	18%	3%	31%	2%	3%
grade 7 events	76643	49183	74475	62164	80791	63611
	74%	15%	7%	6%	13%	44%

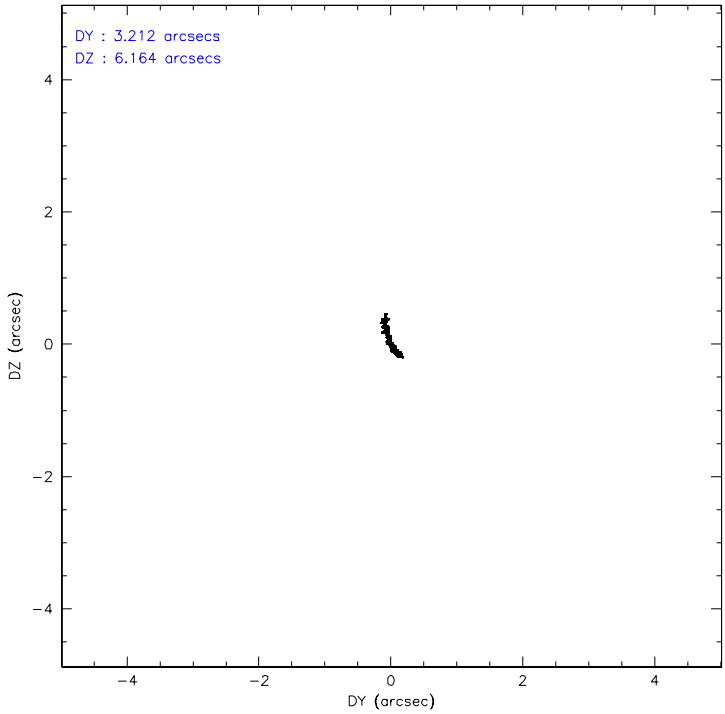
2.2 Compared Parameters

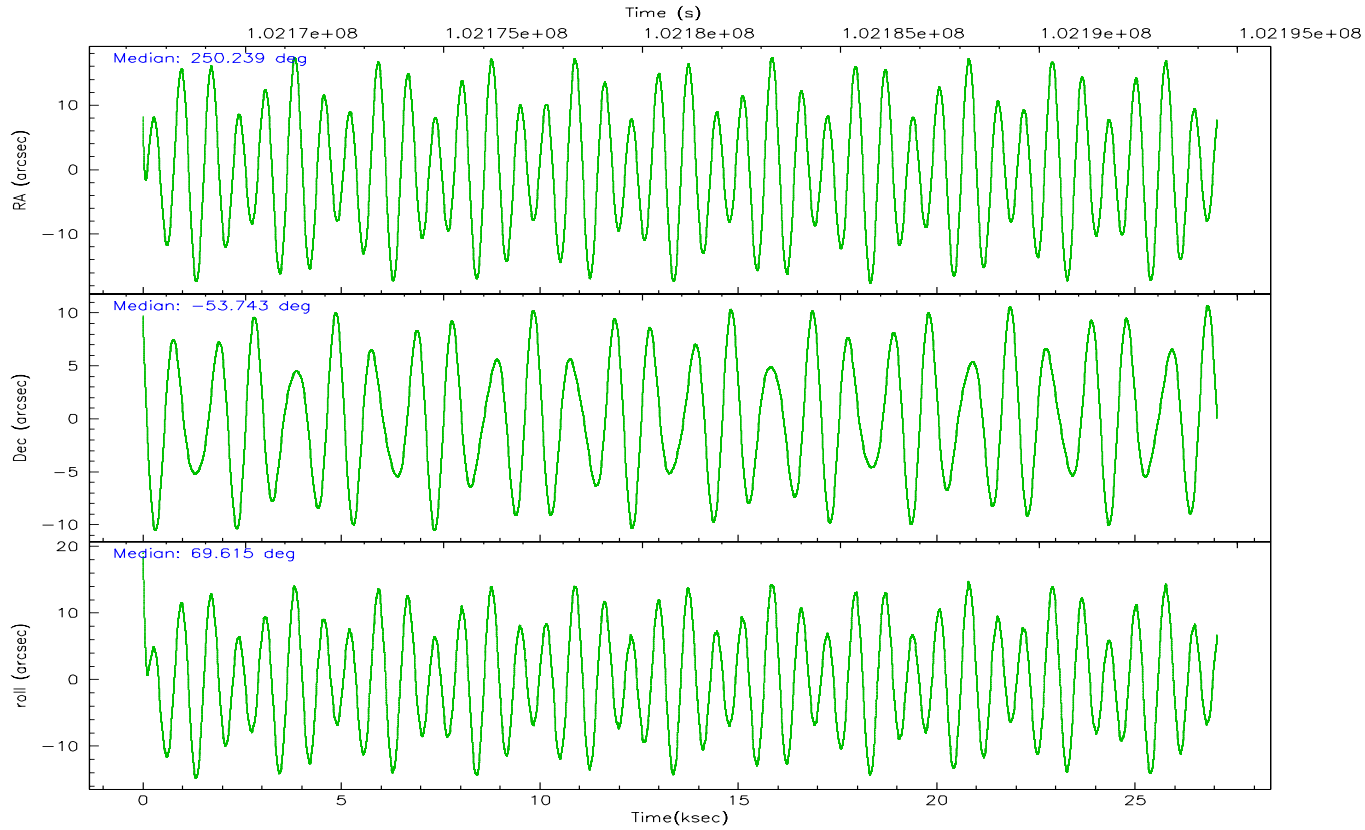
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-456789	ACIS-456789
Grating	HETG	HETG
Data mode	FAINT	FAINT
Observation mode	POINTING	POINTING
Pointing RA	250.247860	250.2397086976574
Pointing Dec	-53.769841	-53.74295529696156
Pointing Roll	69.473865	69.6239223319923
SIM focus pos (mm)	-0.684267	-0.6828225247311905
SIM defocus (mm)	0	0.001444936568705701
SIM translation stage pos (mm)	-182.642523	-182.6373491900168
SIM translation stage offset (mm)	-7.49	-7.495173392990978
Observation start time	102167490.184000	102166316.86424
Observation start date	2001-03-28T11:50:26	2001-03-28T11:31:56
Observation end time	102194490.184000	102195234.67786
Observation end date	2001-03-28T19:20:26	2001-03-28T19:33:54
Read mode	TIMED	TIMED

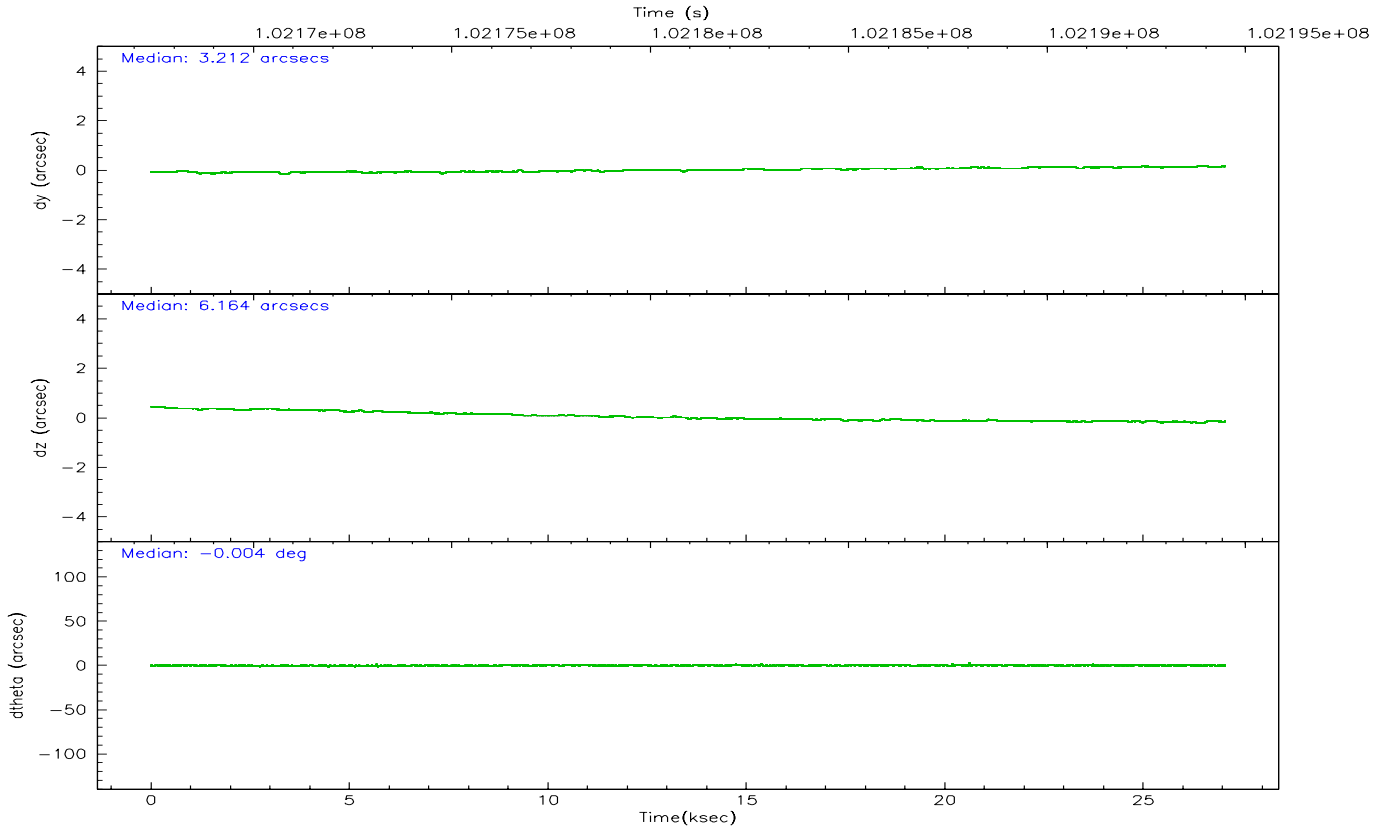
Parameter	Planned	Actual
Obspar format version number	6	6
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	CUSTOM	CUSTOM
Subarray start row	1	1
Subarray row count	400	400
Alternating exposures requested	N	N
Primary exposure time	0.000000	1.4

2.3 Aspect


RA : 250.239 deg
Dec : −53.743 deg
10
5
0
−5
−10
Dec (arcsec)
−10
0
10
RA (arcsec)


DY : 3.212 arcsecs
DZ : 6.164 arcsecs
4
2
0
−2
−4
DZ (arcsec)
−4
−2
0
2
4
DY (arcsec)


Time (s)
1.0217e+08
1.02175e+08
1.0218e+08
1.02185e+08
1.0219e+08
1.02195e+08
Median: 250.239 deg
RA (arcsec)
Median: −53.743 deg
Dec (arcsec)
Median: 69.615 deg
roll (arcsec)
Time(ksec)

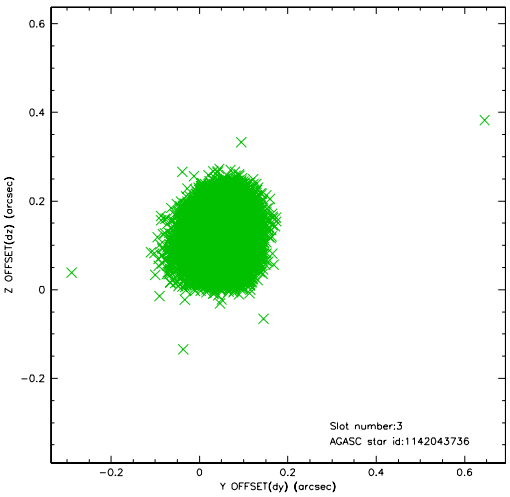

Time (s)
1.0217e+08
1.02175e+08
1.0218e+08
1.02185e+08
1.0219e+08
1.02195e+08
Median: 3.212 arcsecs
dy (arcsec)
Median: 6.164 arcsecs
dz (arcsec)
Median: −0.004 deg
dtheta (arcsec)
Time(ksec)

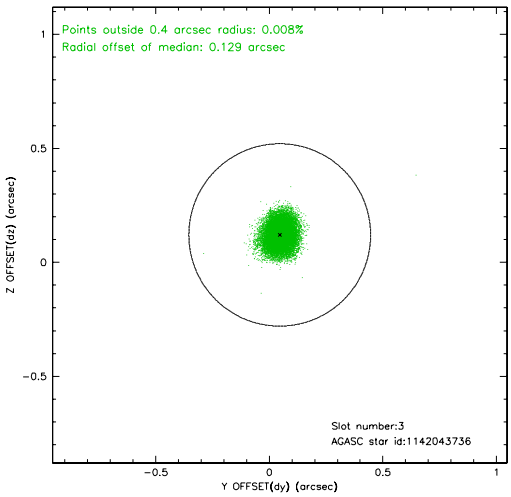
Slot Statistics

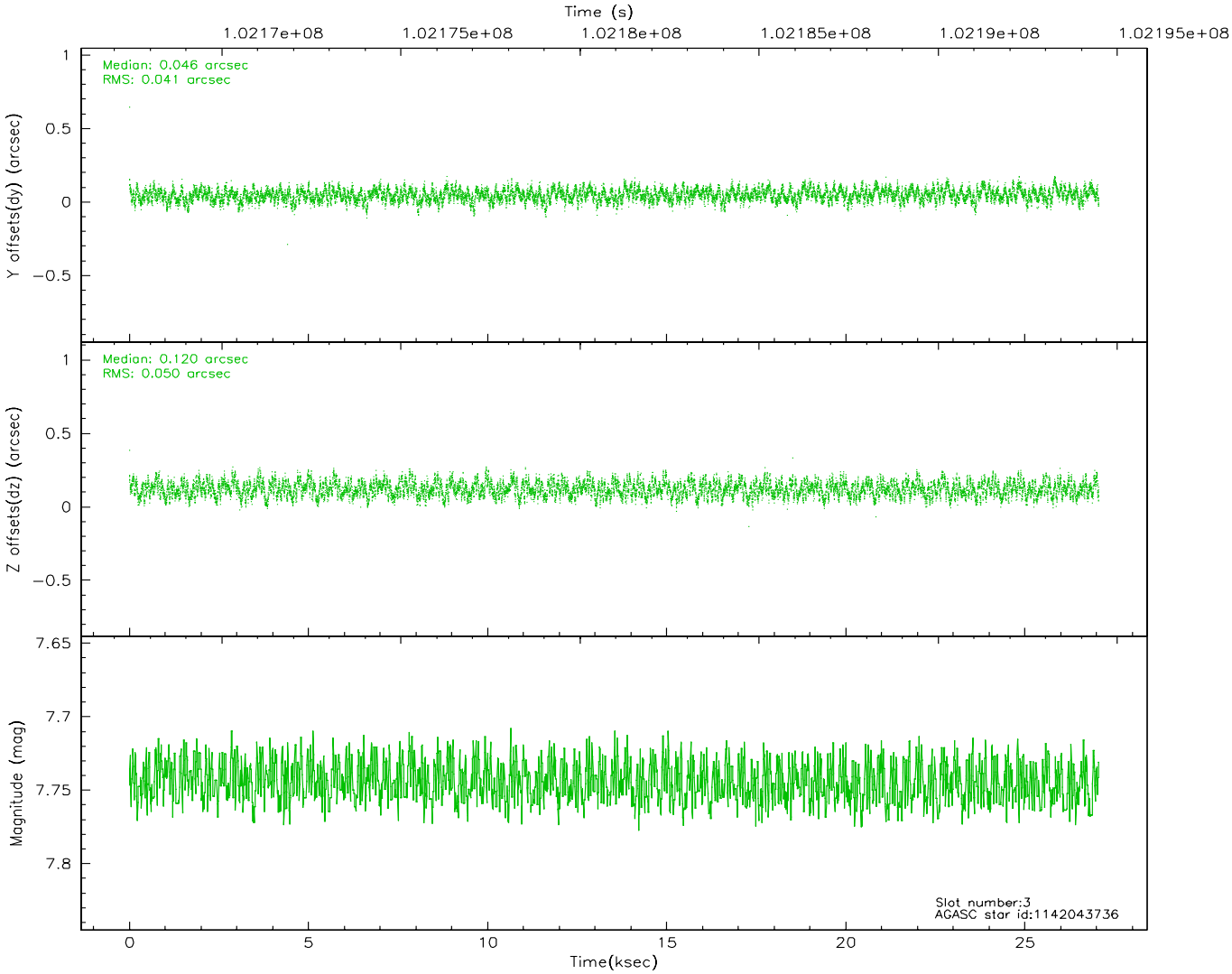
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	7.09	6602	0.042	-0.040	0.007	0.011	0.000000	0.000000	-755.29	-1881.82
1	FID	ACIS-S-3	7.36	6602	-0.080	0.024	0.012	0.019	0.000000	0.000000	57.67	-2011.11
2	FID	ACIS-S-4	7.18	6602	0.012	0.017	0.009	0.017	0.000000	0.000000	2158.04	26.55
3	GUIDE	1142043736	7.75	13204	0.046	0.120	0.069	0.107	250.861726	-54.284643	-1286.80	-1860.16
4	GUIDE	1141915632	8.01	13203	0.139	-0.308	0.055	0.091	249.175229	-53.921117	-1322.28	1931.84
5	GUIDE	1141904960	8.28	13203	-0.125	-0.197	0.057	0.091	249.830144	-53.372737	1022.79	1340.53
6	GUIDE	1142049296	8.31	13200	0.136	0.106	0.069	0.111	250.151068	-54.136674	-1306.78	-272.03
7	GUIDE	1142065272	8.01	13194	-0.198	0.280	0.064	0.104	251.648424	-53.486700	1980.39	-2462.02

2.4 Star Slots

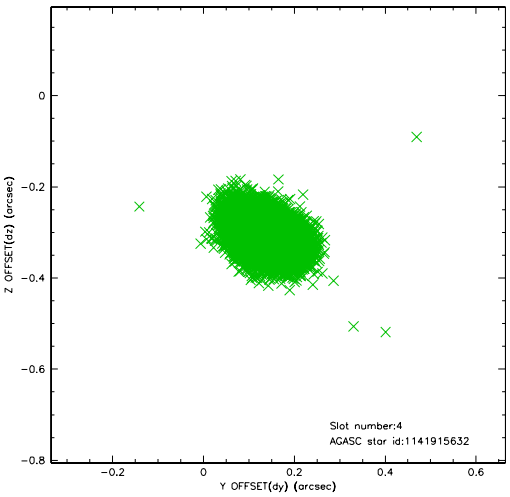
2.4.1 Slot 3

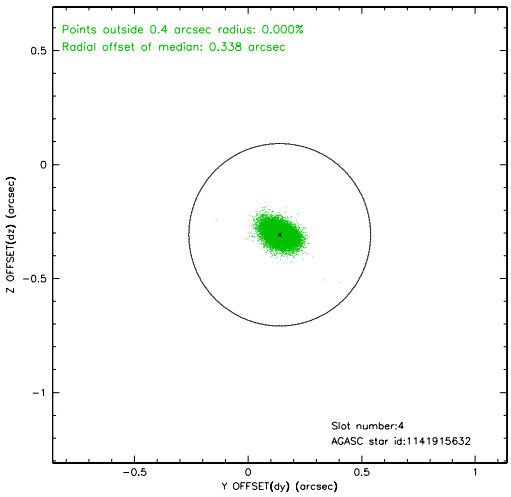


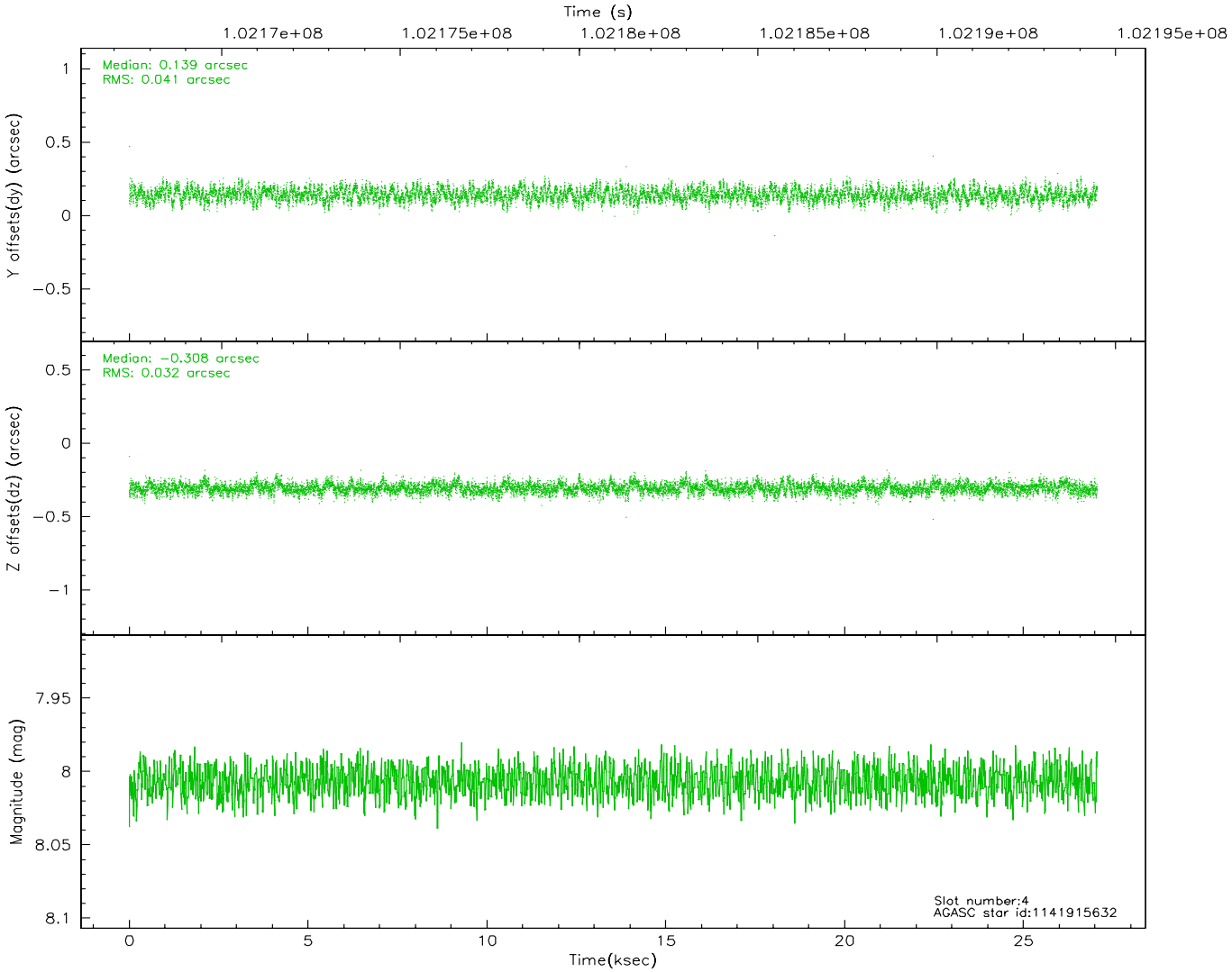




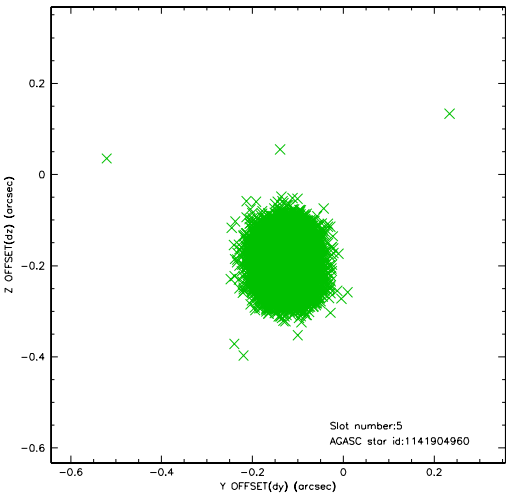
2.4.2 Slot 4

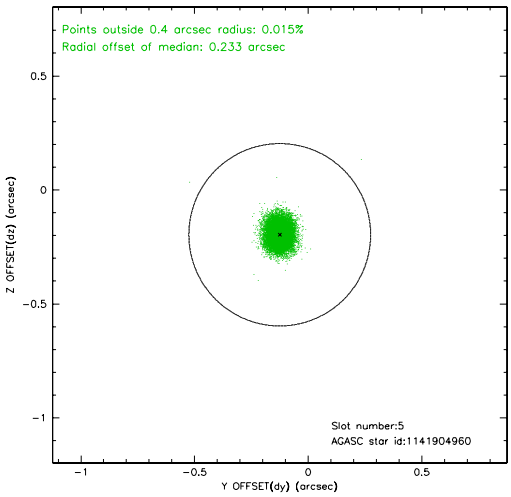

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:4
AGASC star id:1141915632

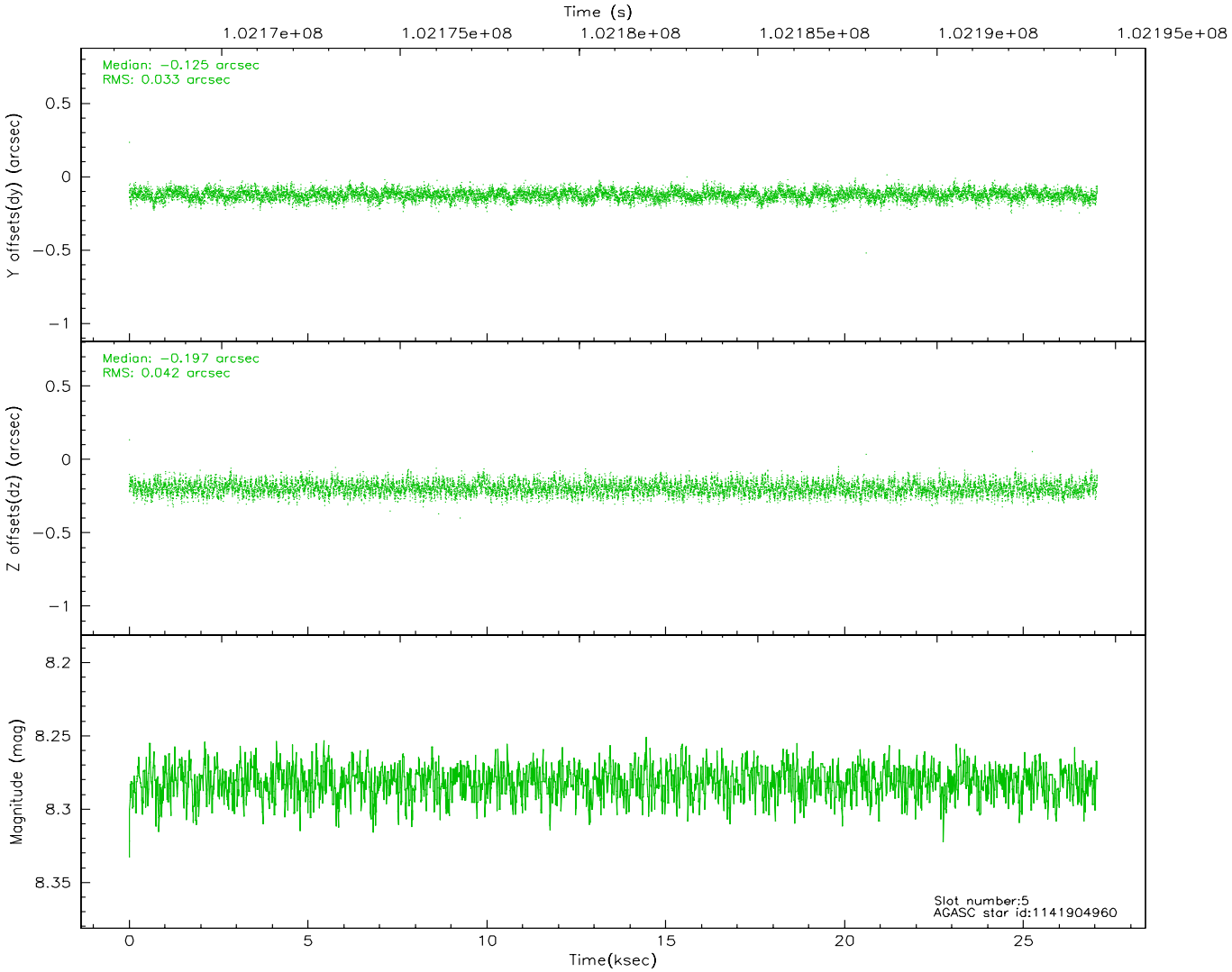

Points outside 0.4 arcsec radius: 0.000%
Radial offset of median: 0.338 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:4
AGASC star id:1141915632


Time (s)
1.0217e+08
1.02175e+08
1.0218e+08
1.02185e+08
1.0219e+08
1.02195e+08
Median: 0.139 arcsec
RMS: 0.041 arcsec
Y offsets(dy) (arcsec)
Median: −0.308 arcsec
RMS: 0.032 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:4
AGASC star id:1141915632
Time(ksec)

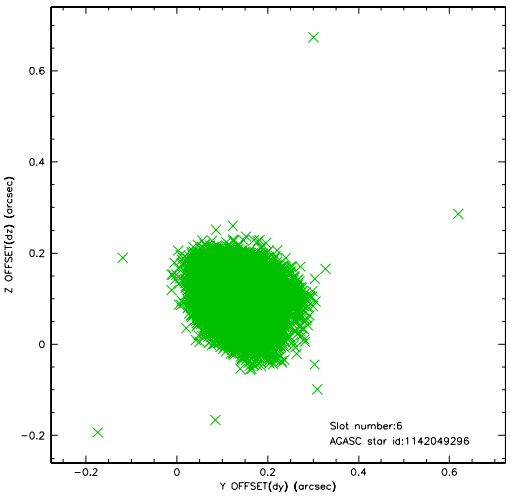
2.4.3 Slot 5

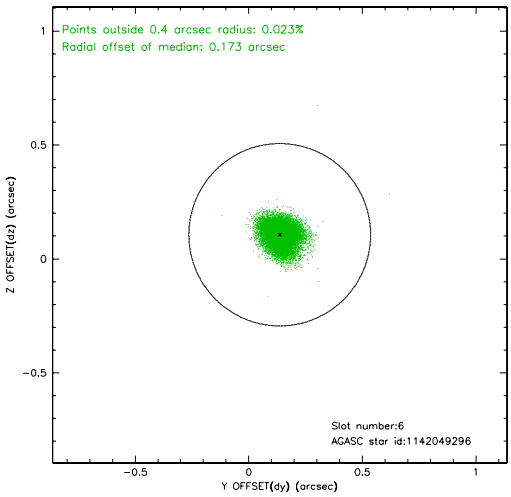

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:5
AGASC star id:1141904960

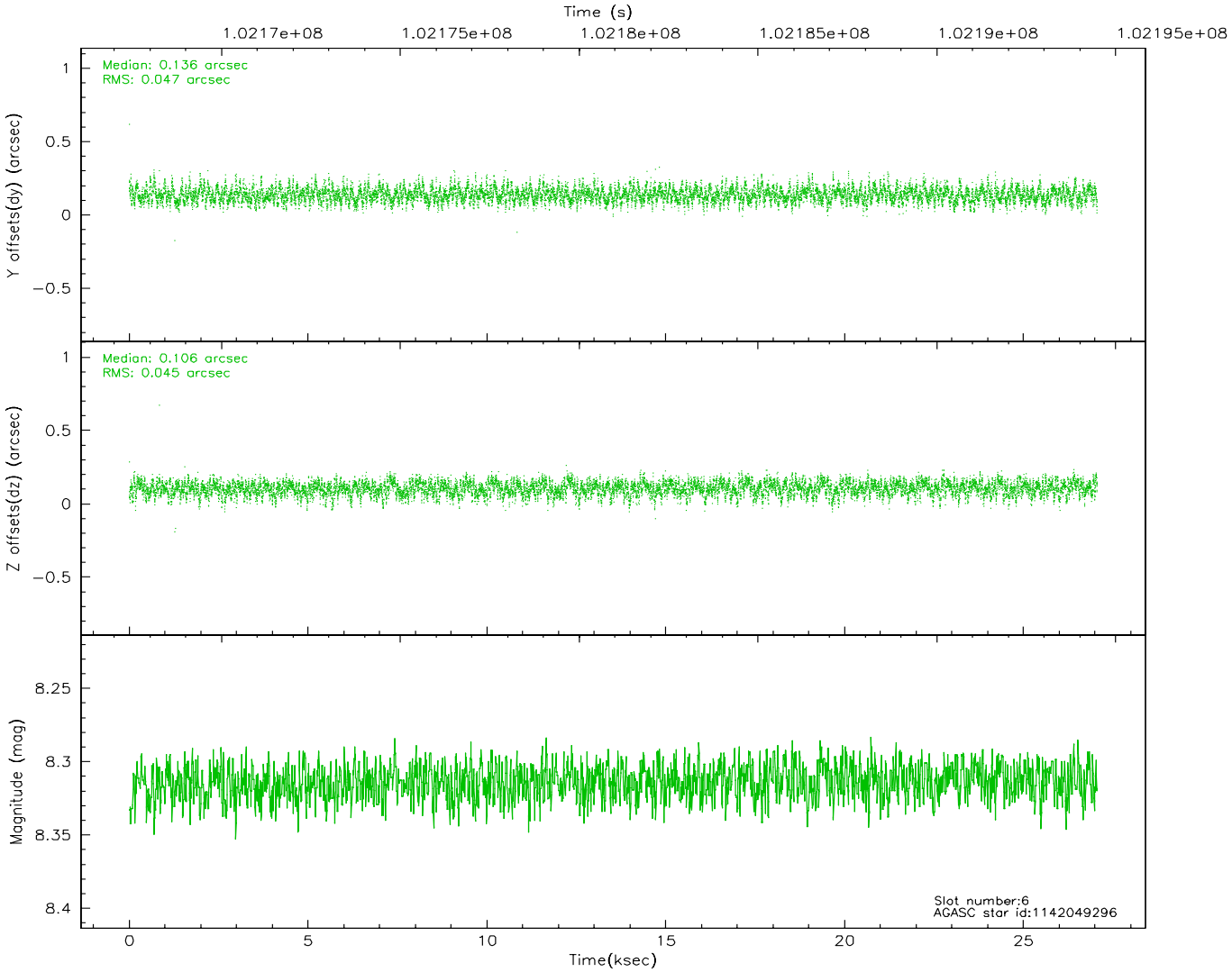

Points outside 0.4 arcsec radius: 0.015%
Radial offset of median: 0.233 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:5
AGASC star id:1141904960


Time (s)
Median: −0.125 arcsec
RMS: 0.033 arcsec
Y offsets(dy) (arcsec)
Median: −0.197 arcsec
RMS: 0.042 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:5
AGASC star id:1141904960
Time(ksec)

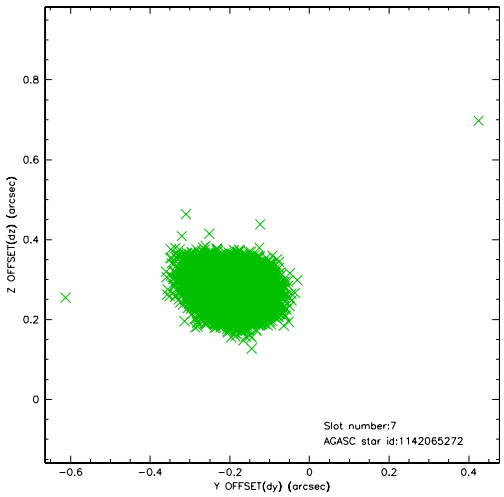
2.4.4 Slot 6

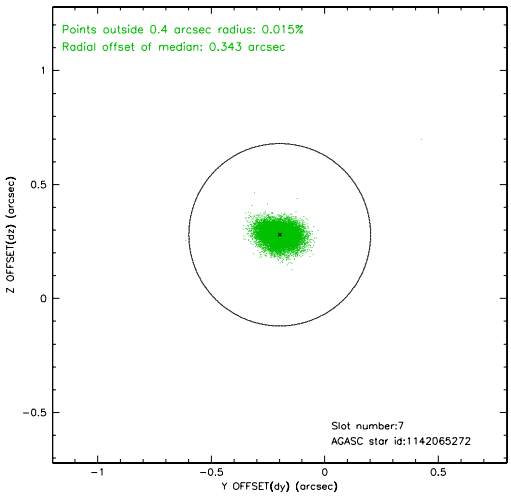

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:6
AGASC star id:1142049296

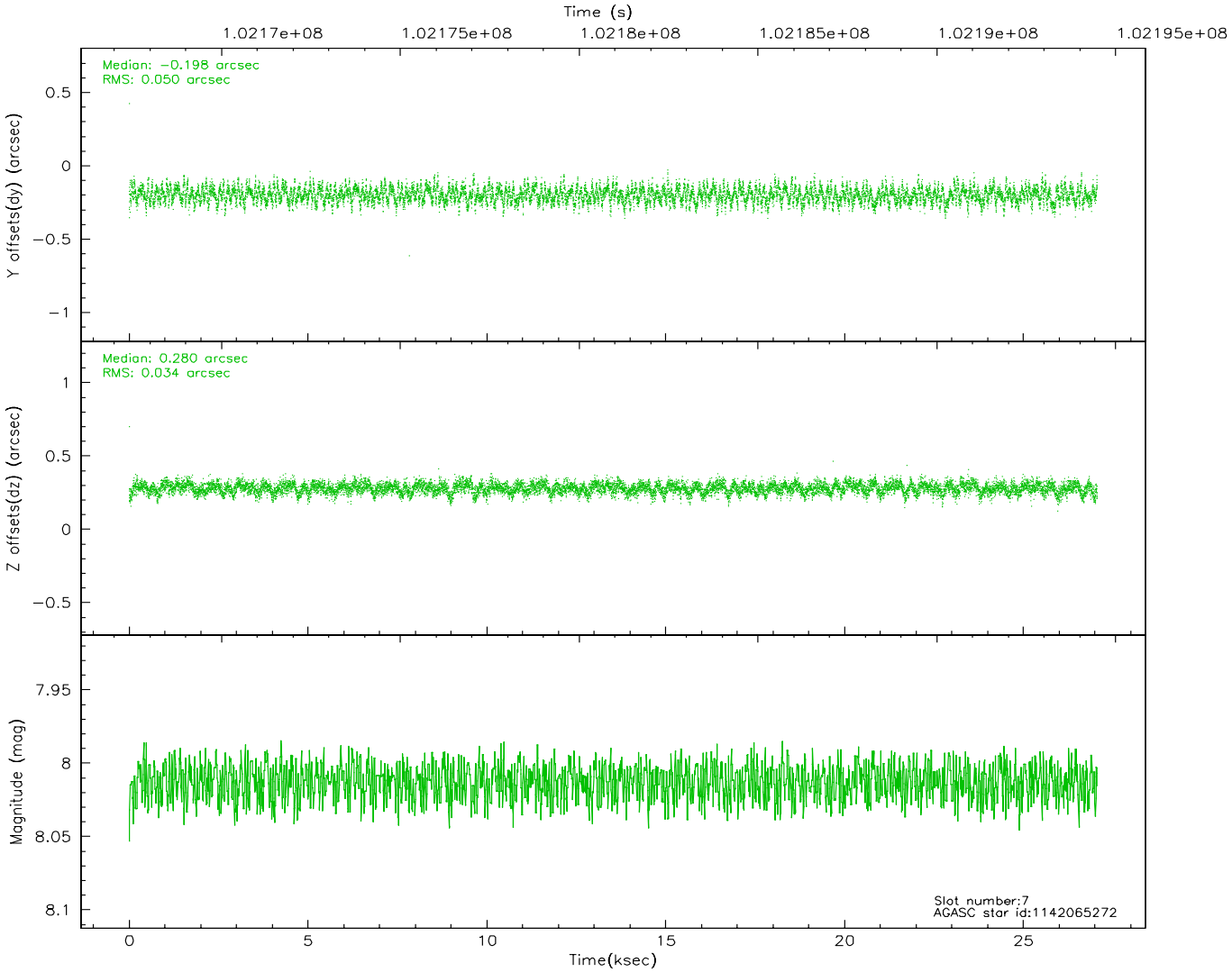

Points outside 0.4 arcsec radius: 0.023%
Radial offset of median: 0.173 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:6
AGASC star id:1142049296


Time (s)
Median: 0.136 arcsec
RMS: 0.047 arcsec
Y offsets(dy) (arcsec)
Median: 0.106 arcsec
RMS: 0.045 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:6
AGASC star id:1142049296
Time(ksec)

2.4.5 Slot 7

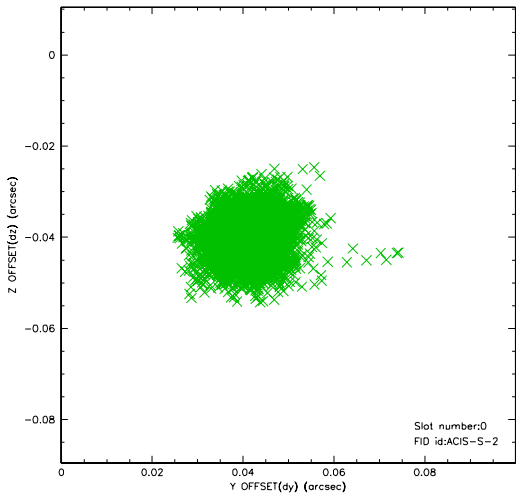

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:7
AGASC star id:1142065272

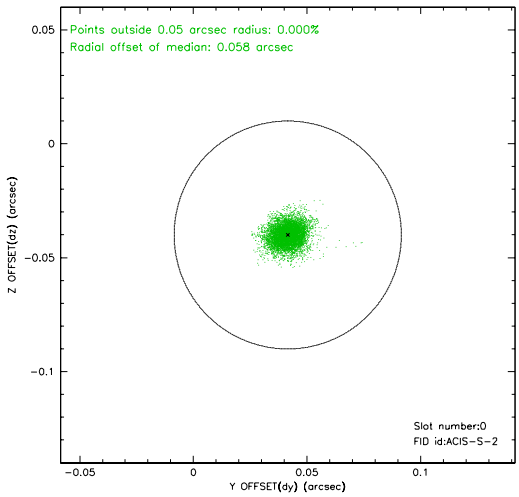

Points outside 0.4 arcsec radius: 0.015%
Radial offset of median: 0.343 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:7
AGASC star id:1142065272

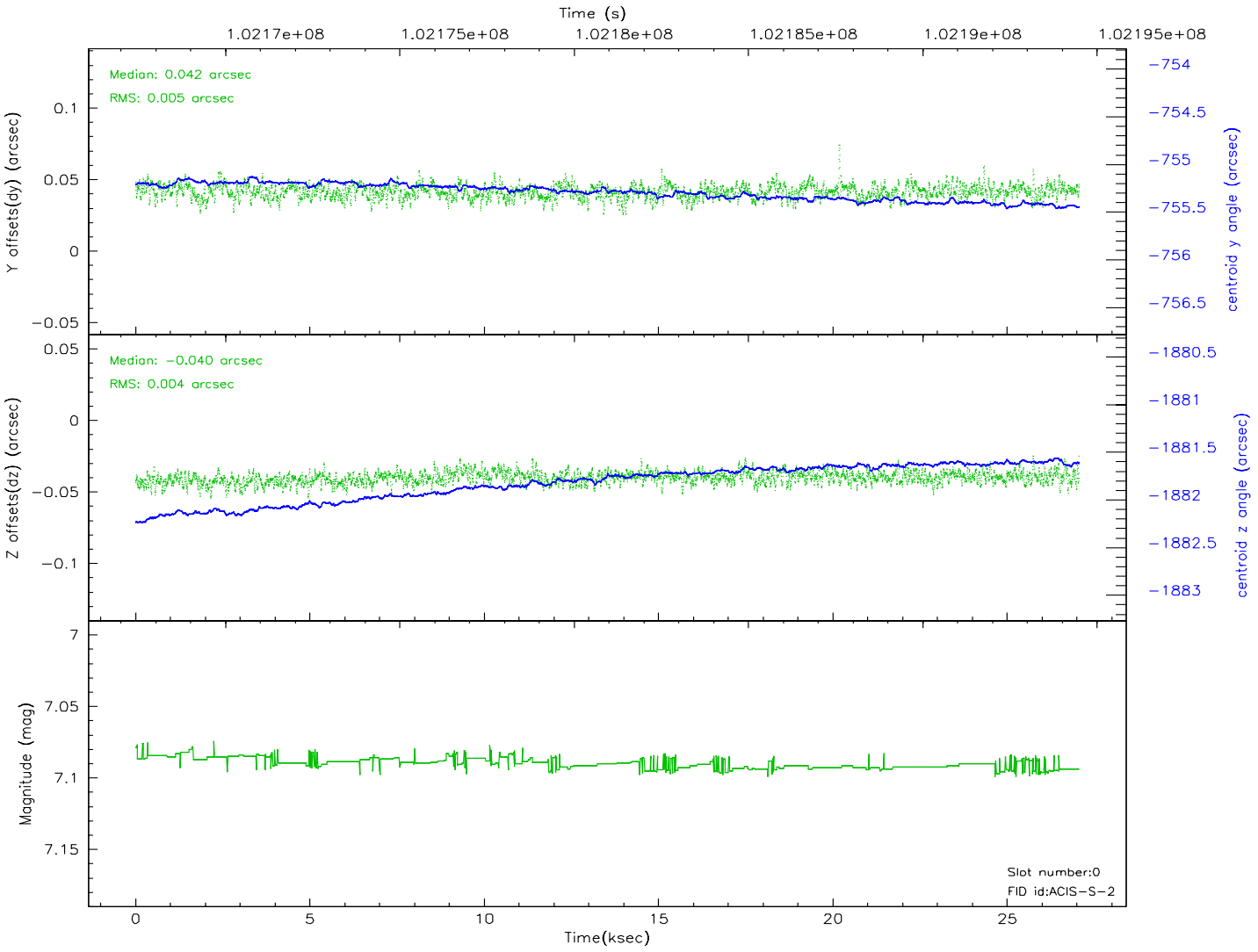

Time (s)
Median: −0.198 arcsec
RMS: 0.050 arcsec
Y offsets(dy) (arcsec)
Median: 0.280 arcsec
RMS: 0.034 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:7
AGASC star id:1142065272
Time(ksec)

2.5 FID Slots

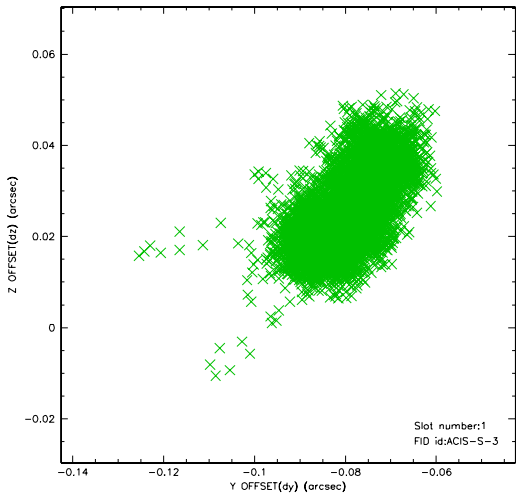
2.5.1 Slot 0

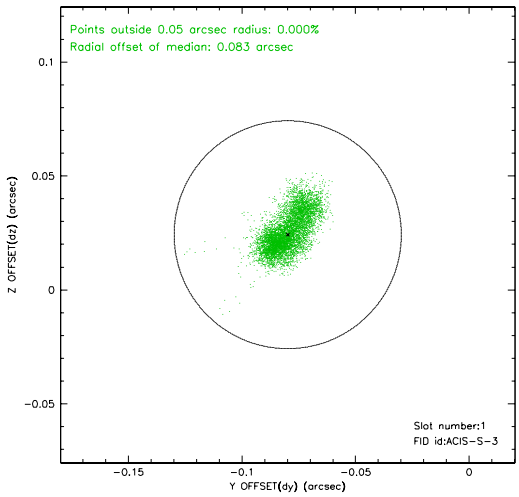


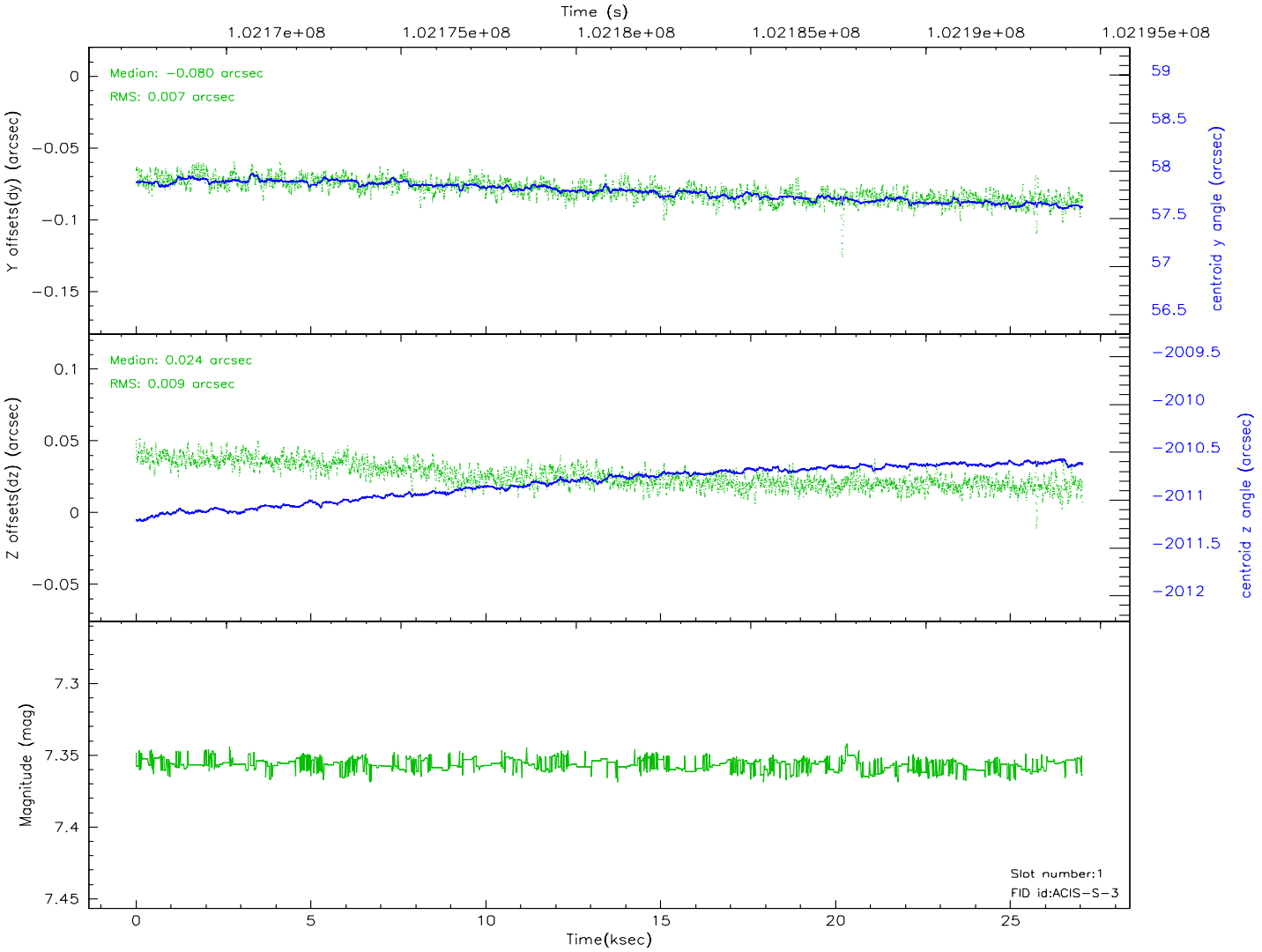




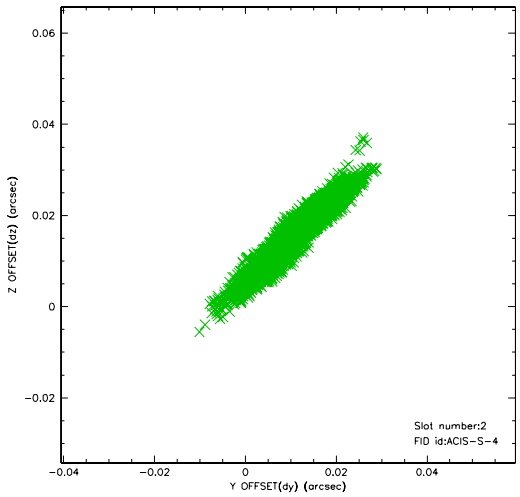
2.5.2 Slot 1

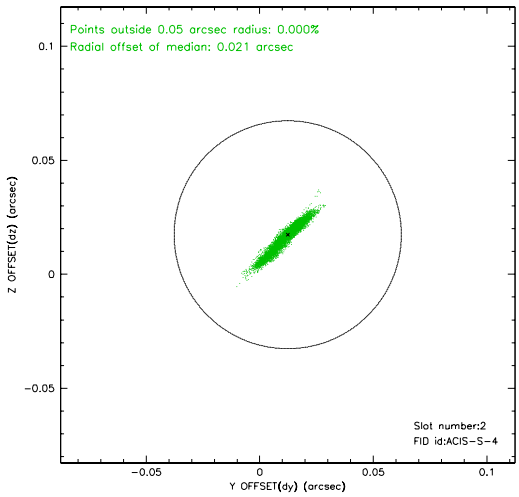

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:1
FID id:ACIS-S-3

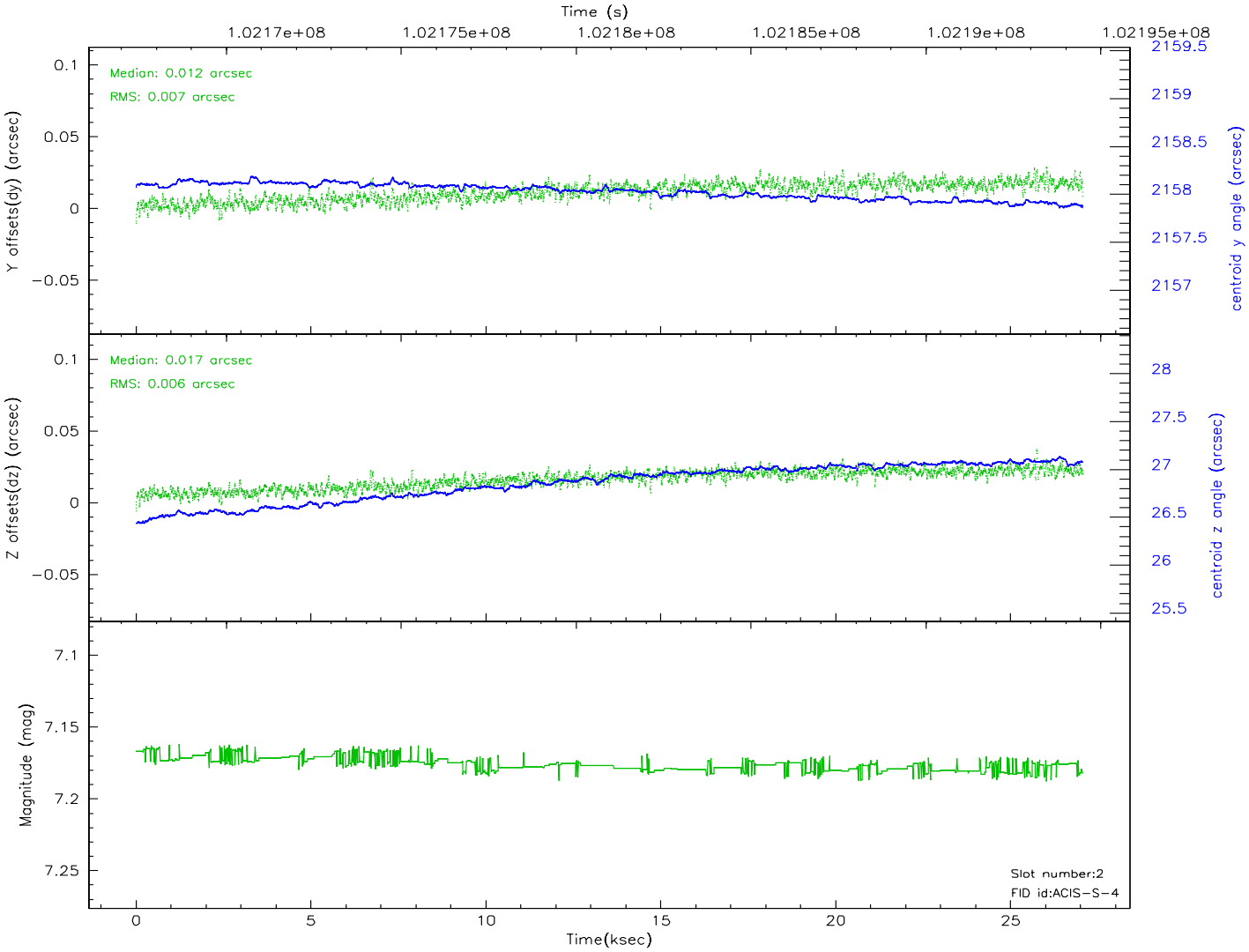

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.083 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:1
FID id:ACIS-S-3


Time (s)
Median: −0.080 arcsec
RMS: 0.007 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.024 arcsec
RMS: 0.009 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number:1
FID id:ACIS-S-3
Time(ksec)

2.5.3 Slot 2

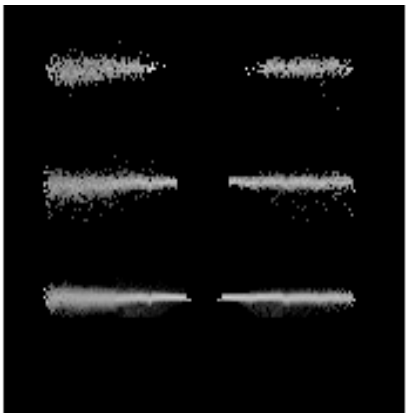

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:2
FID id:ACIS-S-4


Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.021 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:2
FID id:ACIS-S-4

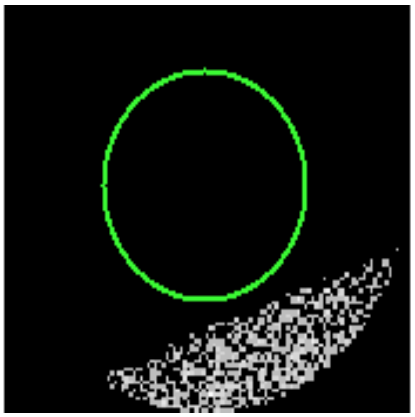

Time (s)
Median: 0.012 arcsec
RMS: 0.007 arcsec
Y offsets(dy) (arcsec)
Median: 0.017 arcsec
RMS: 0.006 arcsec
Z offsets(dz) (arcsec)
centroid y angle (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number:2
FID id:ACIS-S-4
Time(ksec)

3 Gratings

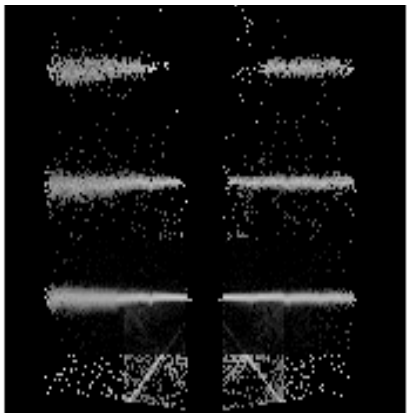
3.1 HEG Arm



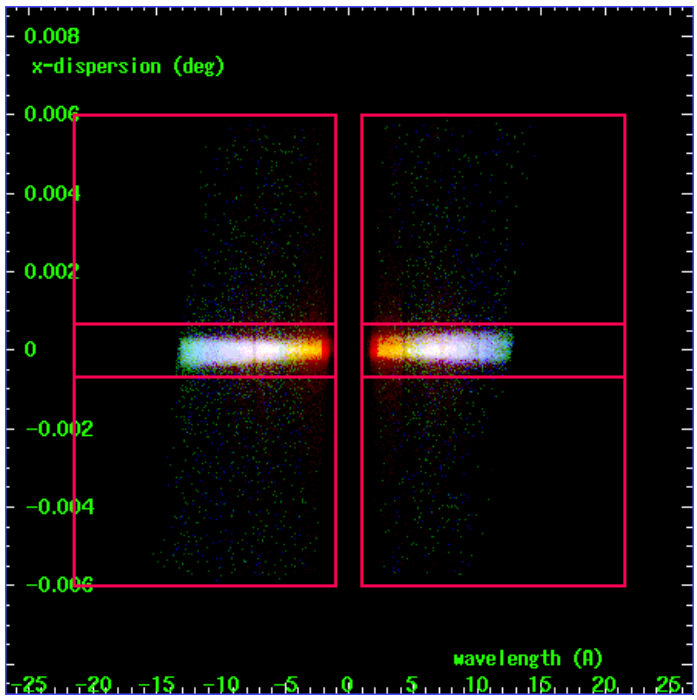
HEG Order Sort 123



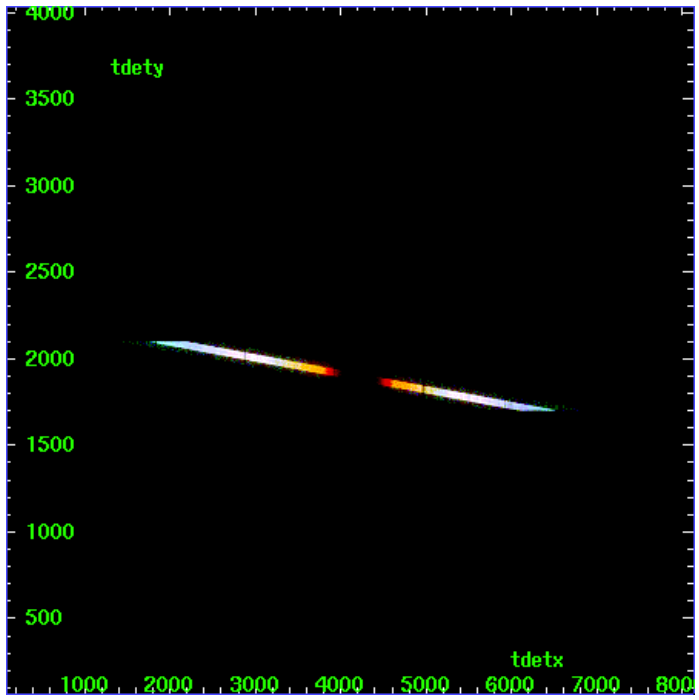
HEG Zero Order



HEG Order Sort ALL

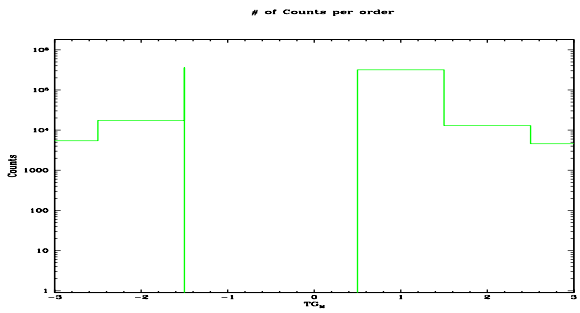


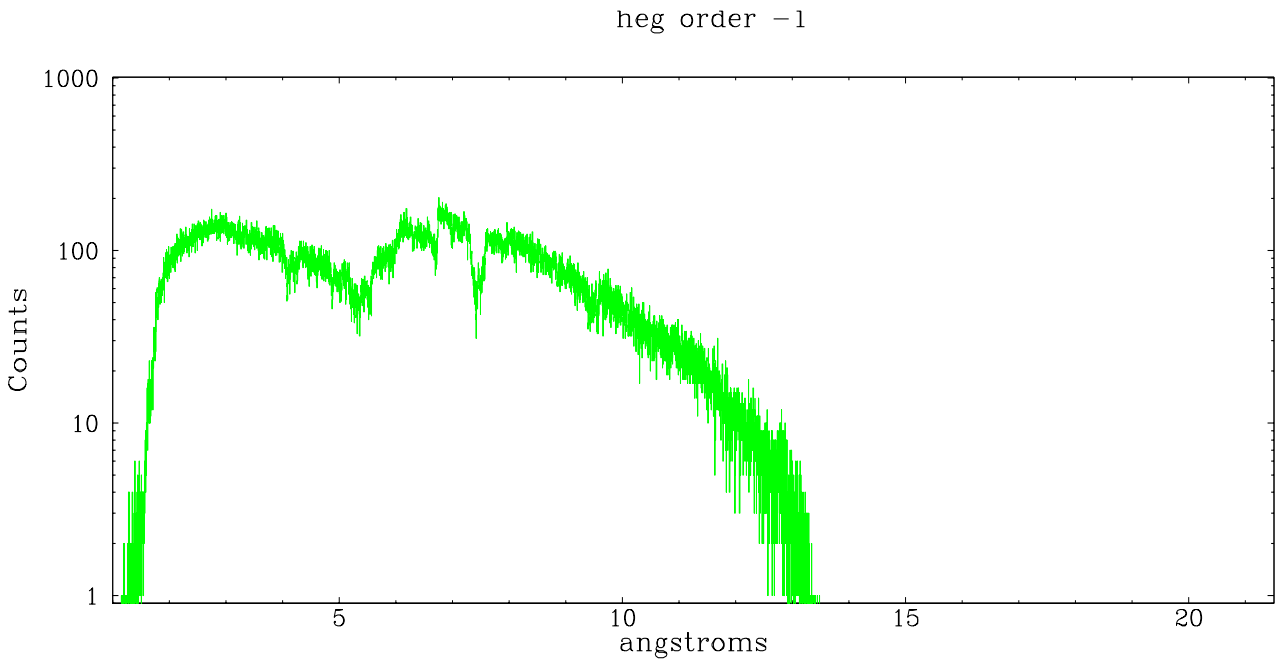
Spot Image HEG

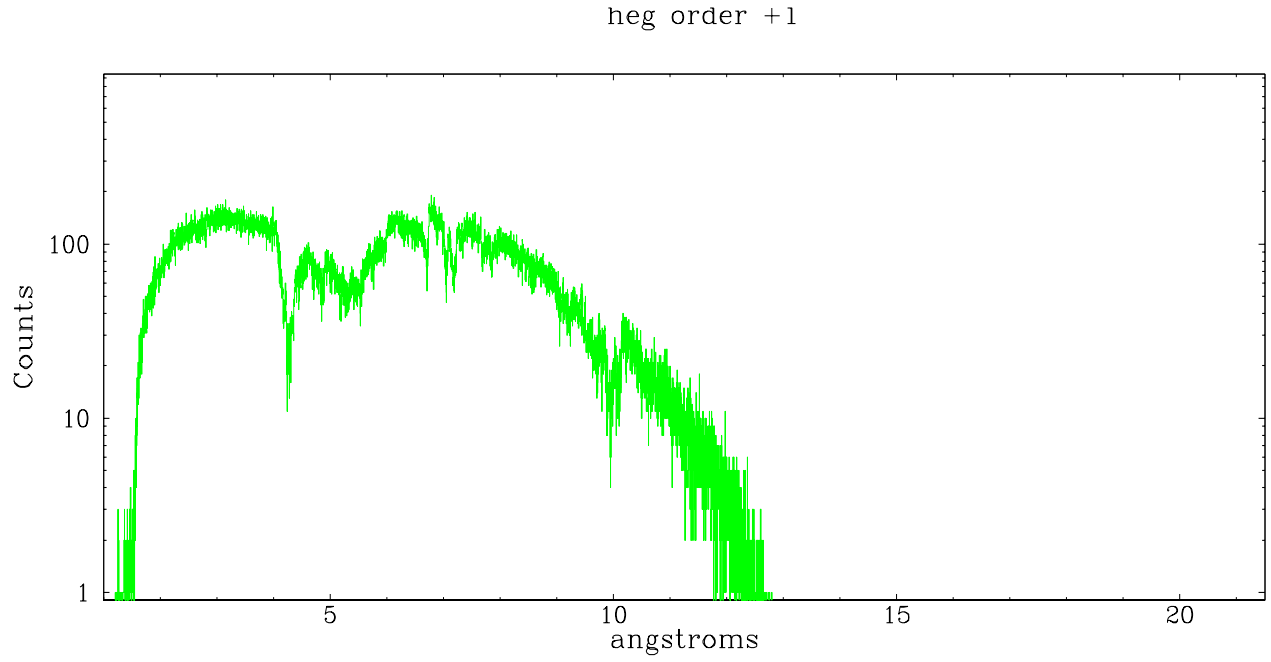


Full Detector HEG

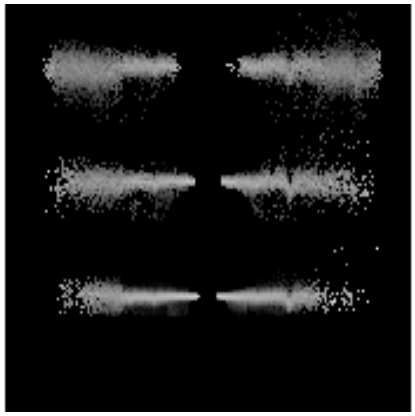
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	5415	17385	357660	0	319056	12994	4562



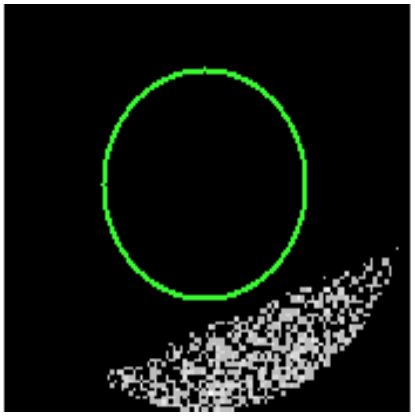

heg order −1
1000
100
10
1
Counts
5
10
15
20
angstroms


heg order +1
100
10
1
Counts
5
10
15
20
angstroms

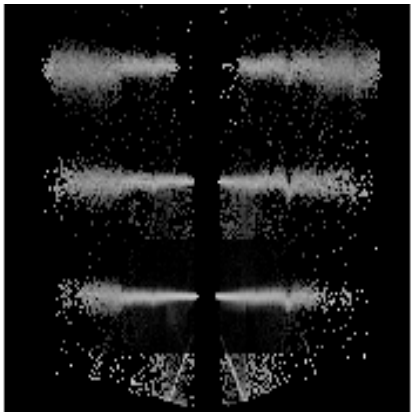
3.2 MEG Arm



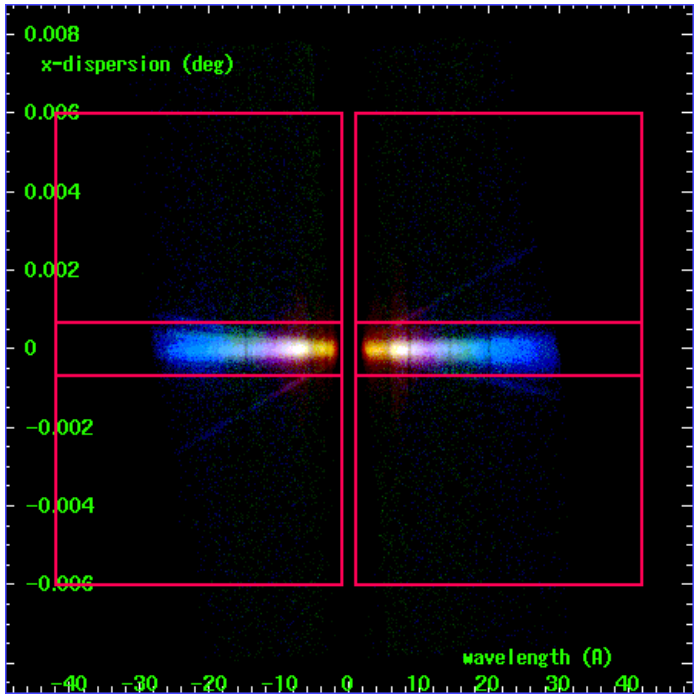
MEG Order Sort 123



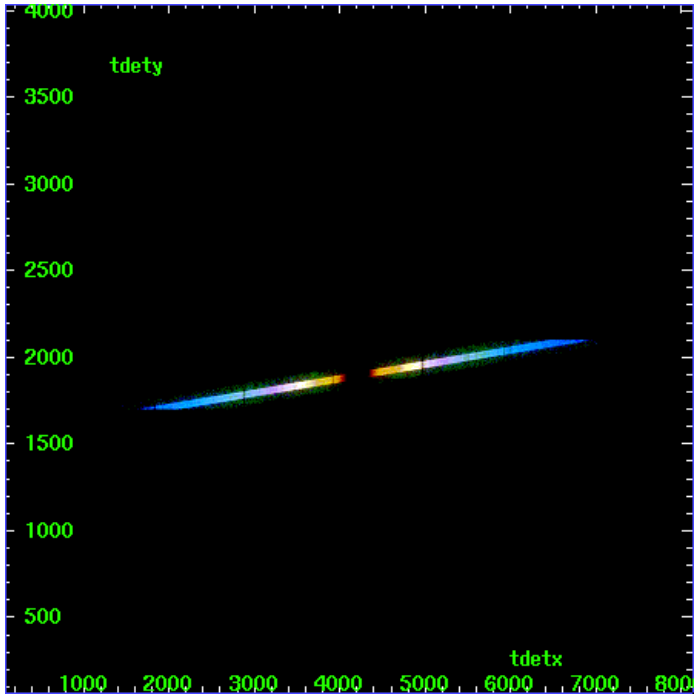
MEG Zero Order



MEG Order Sort ALL

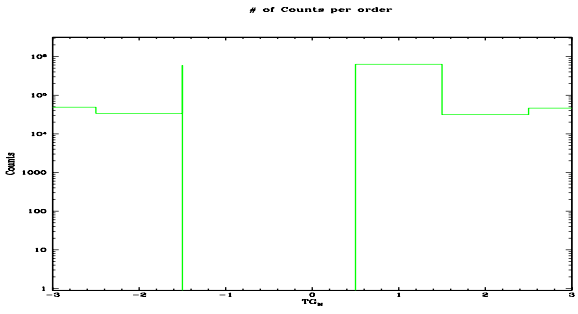


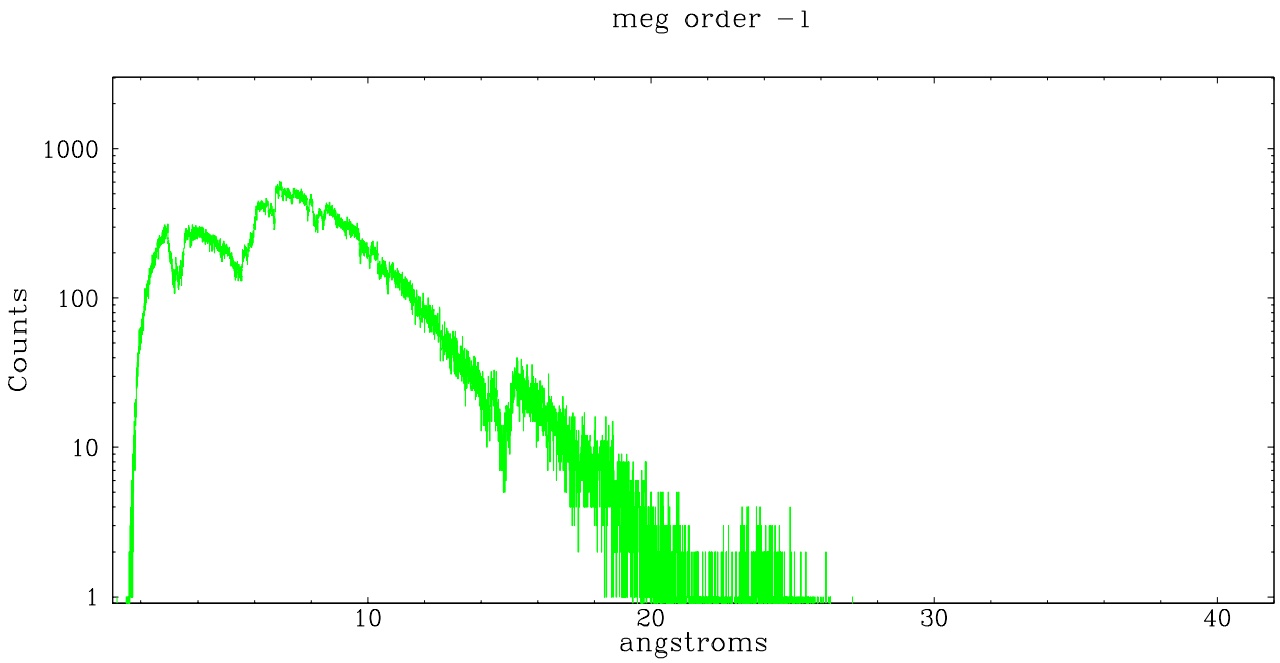
Spot Image MEG

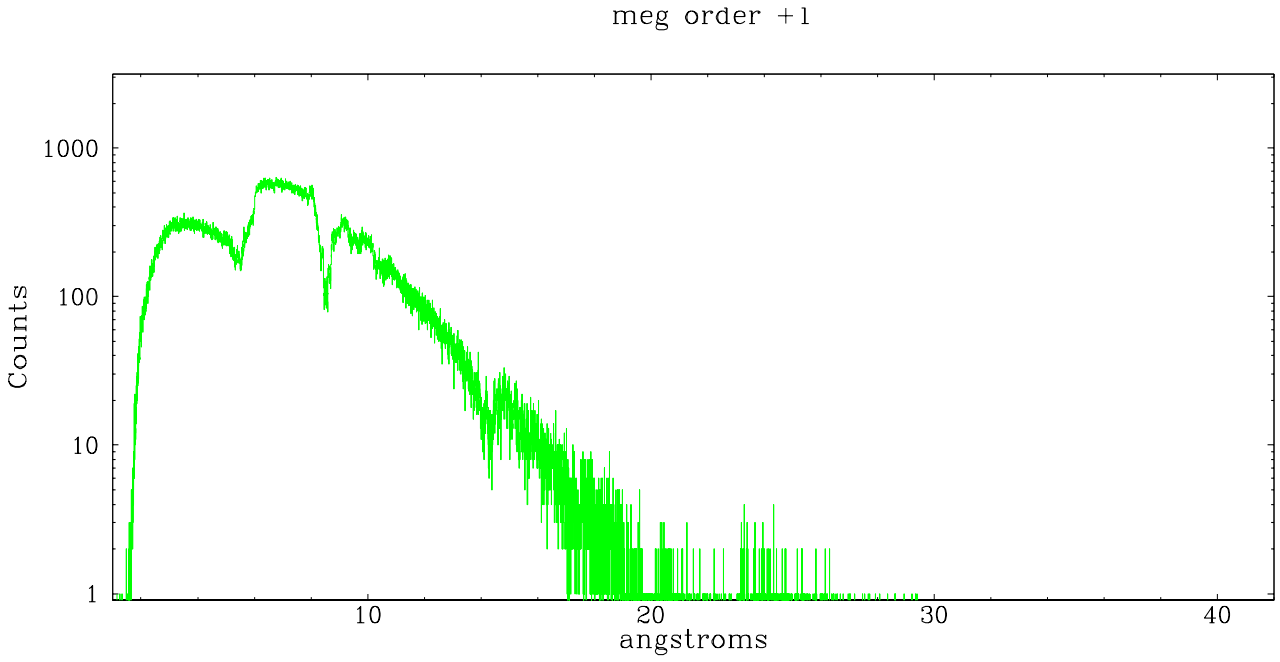


Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	49094	33881	589372	0	628293	31389	46439




meg order −1
1000
100
10
1
Counts
10
20
30
40
angstroms


meg order +1
1000
100
10
1
Counts
10
20
30
40
angstroms

A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2007.03.13
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	27.062

A.2 Comments

Zero-order source is blocked with exclusion window. Standard software processing technique using the tool tgdetect did not give an accurate position for the zeroth order for this observation. Zeroth order position for this observation has been determined using the known angle between the readout streak and the meg spectral arm. The newly determined zeroth order coordinates have been placed in the *src1a.fits file,replacing the coordinates determined by tgdetect. The zeroth order sky coordinates used in this processing of the data are
x=4131.40,y=4034.52;
ra=16:40:55.596, dec=-53:45:05.13.