V&V Reference Report
L2 ASCDS Version : 7.6.7.1

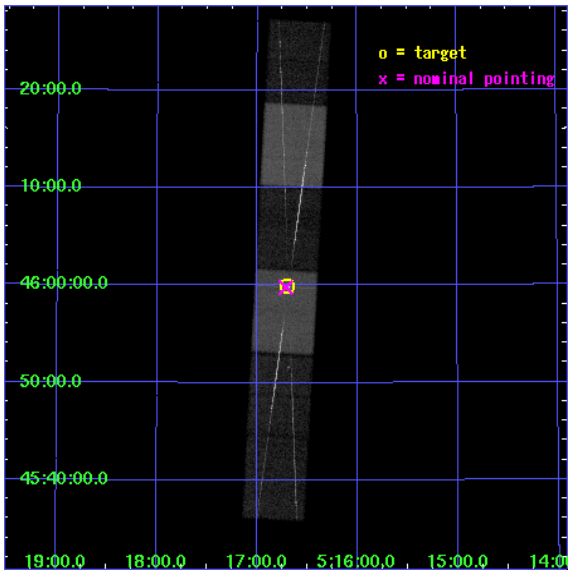
Observation 5040 - L2 Version 001
Chandra X-Ray Center

L2 Processing Date : Apr 17 2006

Contents

1 Front

seq_num	290313
obs_id	5040
title	AO5 Calibration Observations of Capella
observer	Dr. CXC Calibration
object	Capella
dtycycle	0
cycle	P
ra_targ	79.17625
dec_targ	45.997889
ra_nom	79.17878030308
dec_nom	45.996507399253
roll_nom	93.154807740153
revision	2
ontime	29142.5
livetime	28671.82334792
ontime4	29142.5
ontime5	29142.5
ontime6	29142.5
ontime7	29142.5
ontime8	29142.5
ontime9	29142.5
l2events	333280

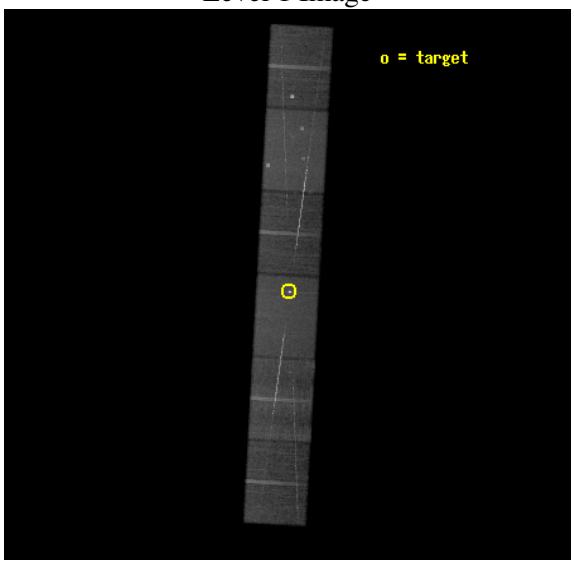


2 OBI

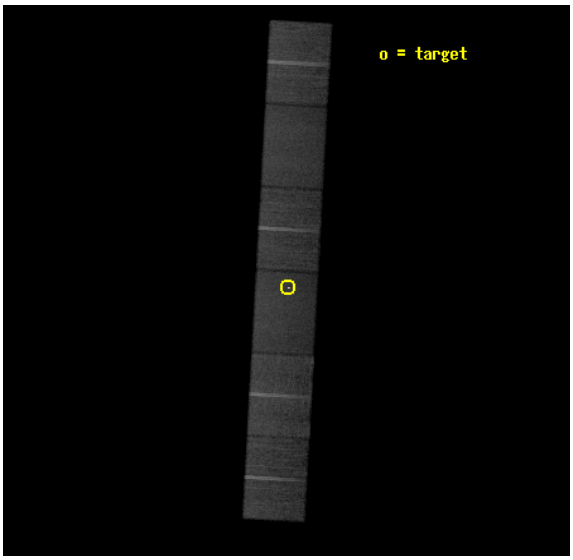
2.1 OBI

2.1.1 Images

Level 1 Image

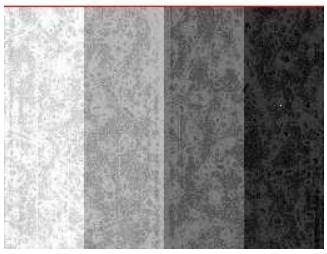


Level 1 Bad Events

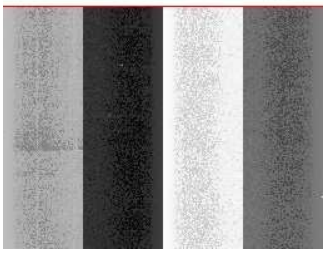


2.1.2 Bias

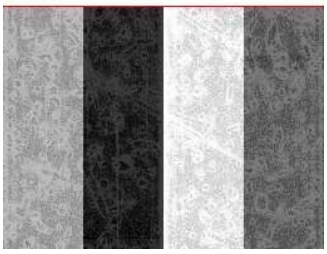
Chip 4



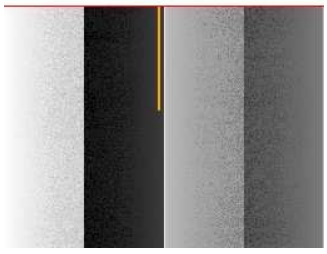
Chip 5



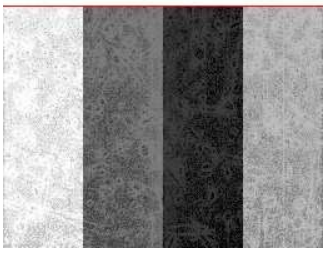
Chip 6



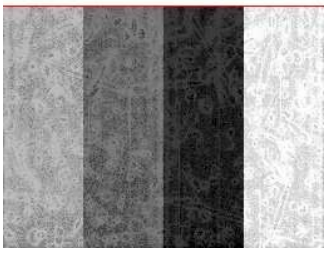
Chip 7



Chip 8



Chip 9



2.1.3 Parameters

obi_num	0
ascdsver	7.6.7.1
caldbver	3.2.1
date	2006-04-17T13:53:30
revision	2

sched_exp_time	29000.000000
ontime	30387.945996284
ontime4	30387.945976377
ontime5	30387.945976377
ontime6	30387.945996284
ontime7	30387.945996284
ontime8	30387.945976377
ontime9	30387.945976377
l1events	1354550

2.1.4 Events

	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	201849	278448	194339	257022	245035	177857
rejected events	171770	149953	157351	155217	179395	153006
rejected %	85%	53%	80%	60%	73%	86%

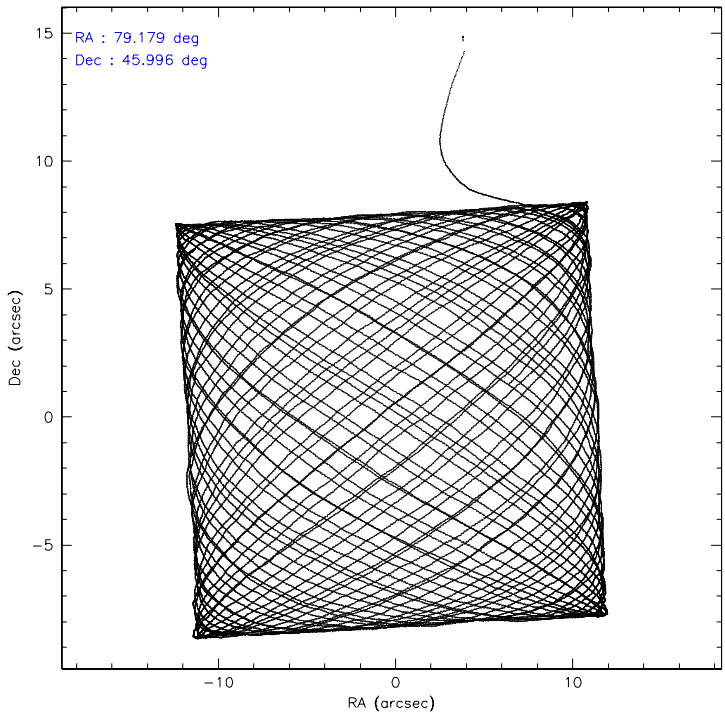
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
grade 0 events	18425	17757	22885	8223	31801	12488
	9%	6%	11%	3%	12%	7%
grade 1 events	158	395	164	328	206	89
	0%	0%	0%	0%	0%	0%
grade 2 events	4811	39668	5795	25755	12012	4431
	2%	14%	2%	10%	4%	2%
grade 3 events	2443	4645	2616	6473	5511	2361
	1%	1%	1%	2%	2%	1%
grade 4 events	2234	4341	2484	6503	5146	2345
	1%	1%	1%	2%	2%	1%
grade 5 events	7419	12870	7998	17806	10524	8305
	3%	4%	4%	6%	4%	4%
grade 6 events	3424	67498	4233	58662	13295	4142
	1%	24%	2%	22%	5%	2%
grade 7 events	162935	131274	148164	133272	166540	143696
	80%	47%	76%	51%	67%	80%

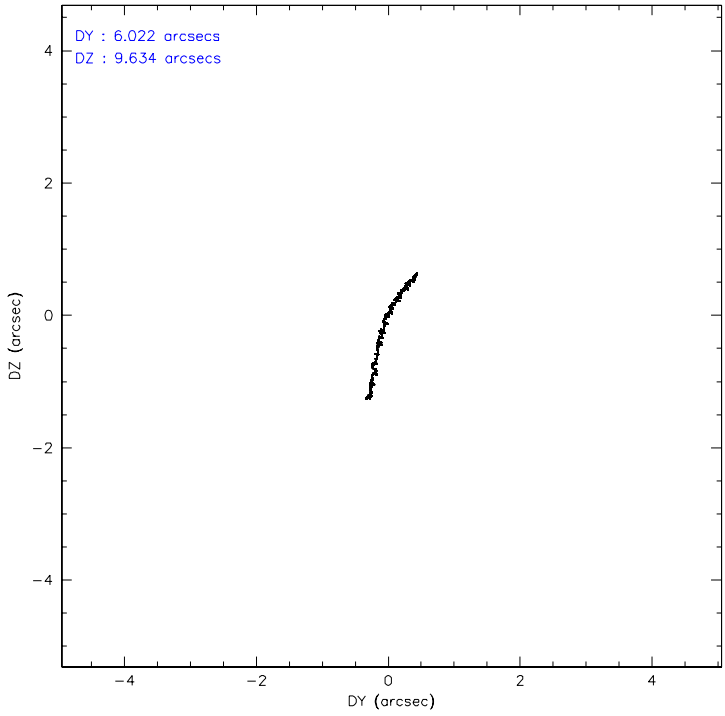
2.2 Compared Parameters

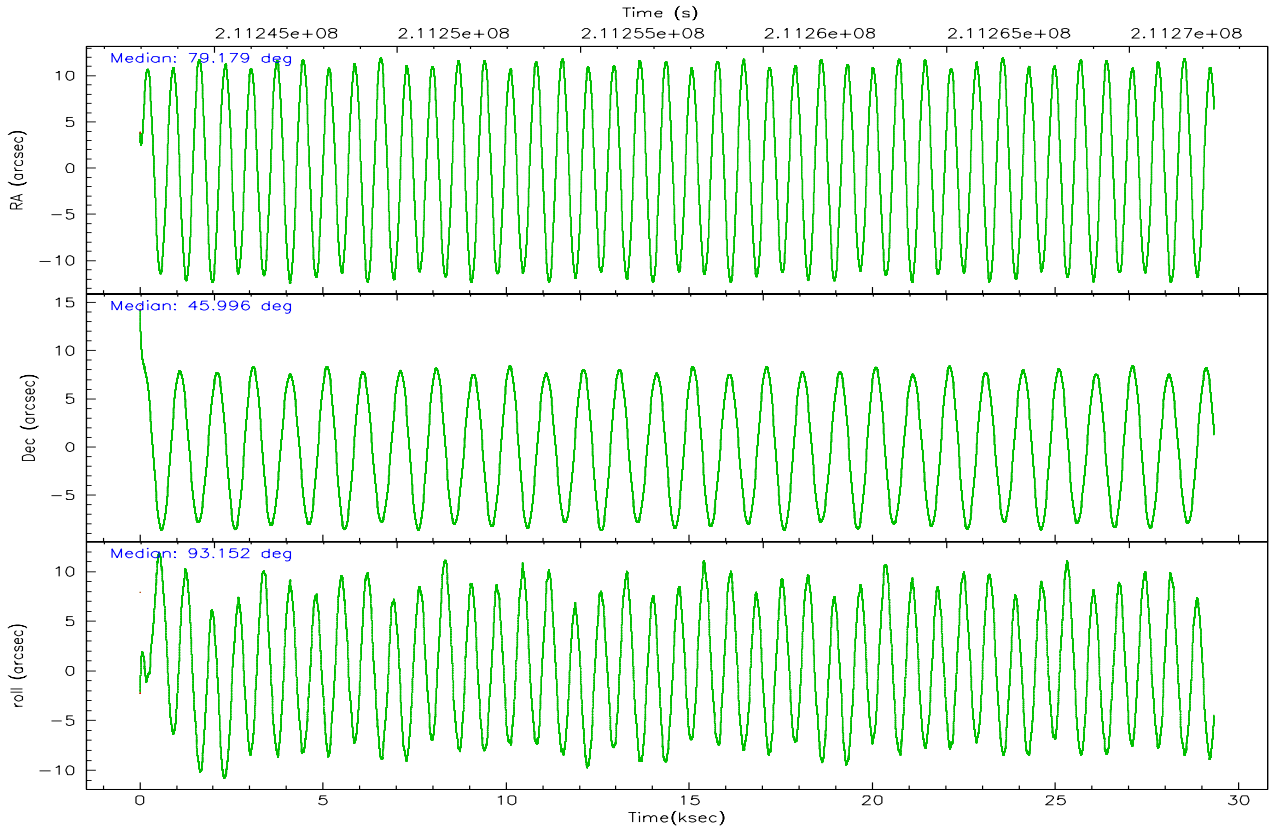
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-456789	ACIS-456789
Grating	HETG	HETG
Data mode	FAINT	FAINT
Observation mode	POINTING	POINTING
Pointing RA	79.200631	79.17878030308003
Pointing Dec	45.973912	45.99650739925323
Pointing Roll	92.982469	93.15480774015313
Window start time	210384064.184000	210384064.184000
Window stop time	215568064.184000	215568064.184000
SIM focus pos (mm)	-0.684267	-0.6828225247311905
SIM defocus (mm)	0	0.001444936568705701
SIM translation stage pos (mm)	-187.132523	-187.1254020033014
SIM translation stage offset (mm)	-3	-3.007120579706367
Observation start time	211243128.184000	211241409.92778
Observation start date	2004-09-10T22:37:44	2004-09-10T22:10:09
Observation end time	211272128.184000	211272309.57916
Observation end date	2004-09-11T06:41:04	2004-09-11T06:45:09
Read mode	TIMED	TIMED

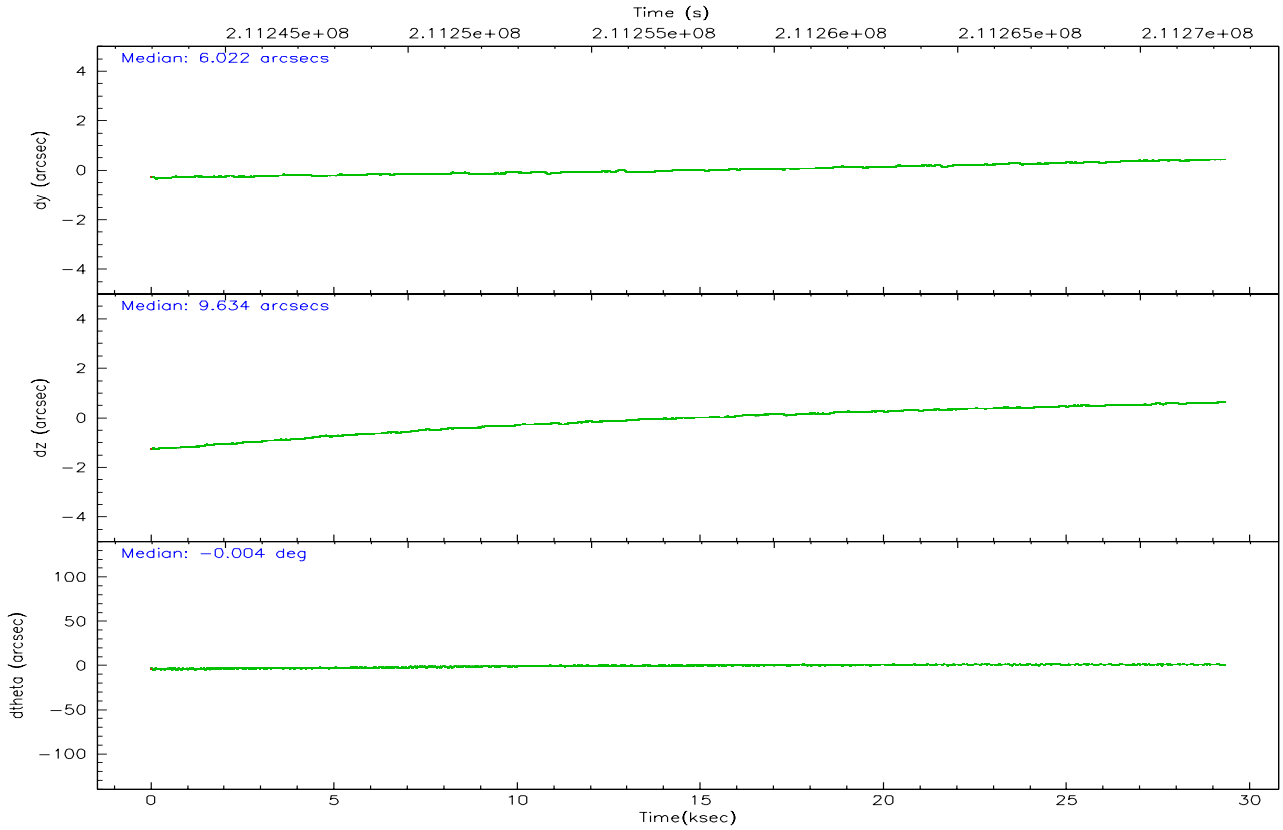
Parameter	Planned	Actual
Obspar format version number	6	6
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
On-chip summing requested	N	N
Subarray requested	CUSTOM	CUSTOM
Subarray start row	1	1
Subarray row count	774	774
Alternating exposures requested	N	N
Primary exposure time	0.000000	2.5

2.3 Aspect


RA : 79.179 deg
Dec : 45.996 deg
15
10
5
0
−5
Dec (arcsec)
−10
0
10
RA (arcsec)


DY : 6.022 arcsecs
DZ : 9.634 arcsecs
4
2
0
−2
−4
DZ (arcsec)
−4
−2
0
2
4
DY (arcsec)


Time (s)
2.11245e+08
2.1125e+08
2.11255e+08
2.1126e+08
2.11265e+08
2.1127e+08
Median: 79.179 deg
RA (arcsec)
Median: 45.996 deg
Dec (arcsec)
Median: 93.152 deg
roll (arcsec)
Time(ksec)

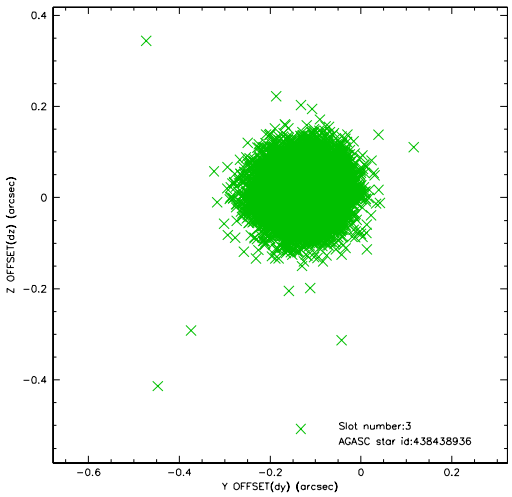

Time (s)
2.11245e+08
2.1125e+08
2.11255e+08
2.1126e+08
2.11265e+08
2.1127e+08
Median: 6.022 arcsecs
dy (arcsec)
Median: 9.634 arcsecs
dz (arcsec)
Median: −0.004 deg
dtheta (arcsec)
Time(ksec)

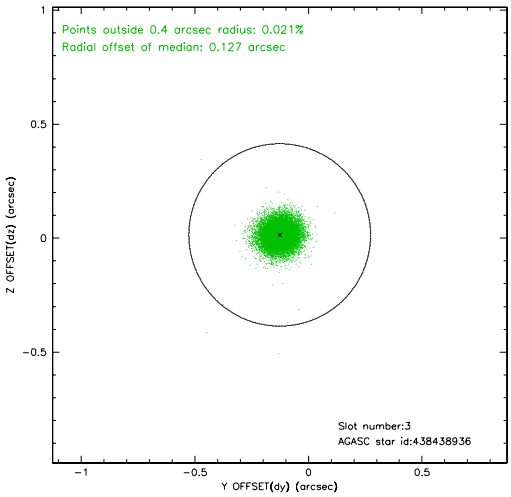
Slot Statistics

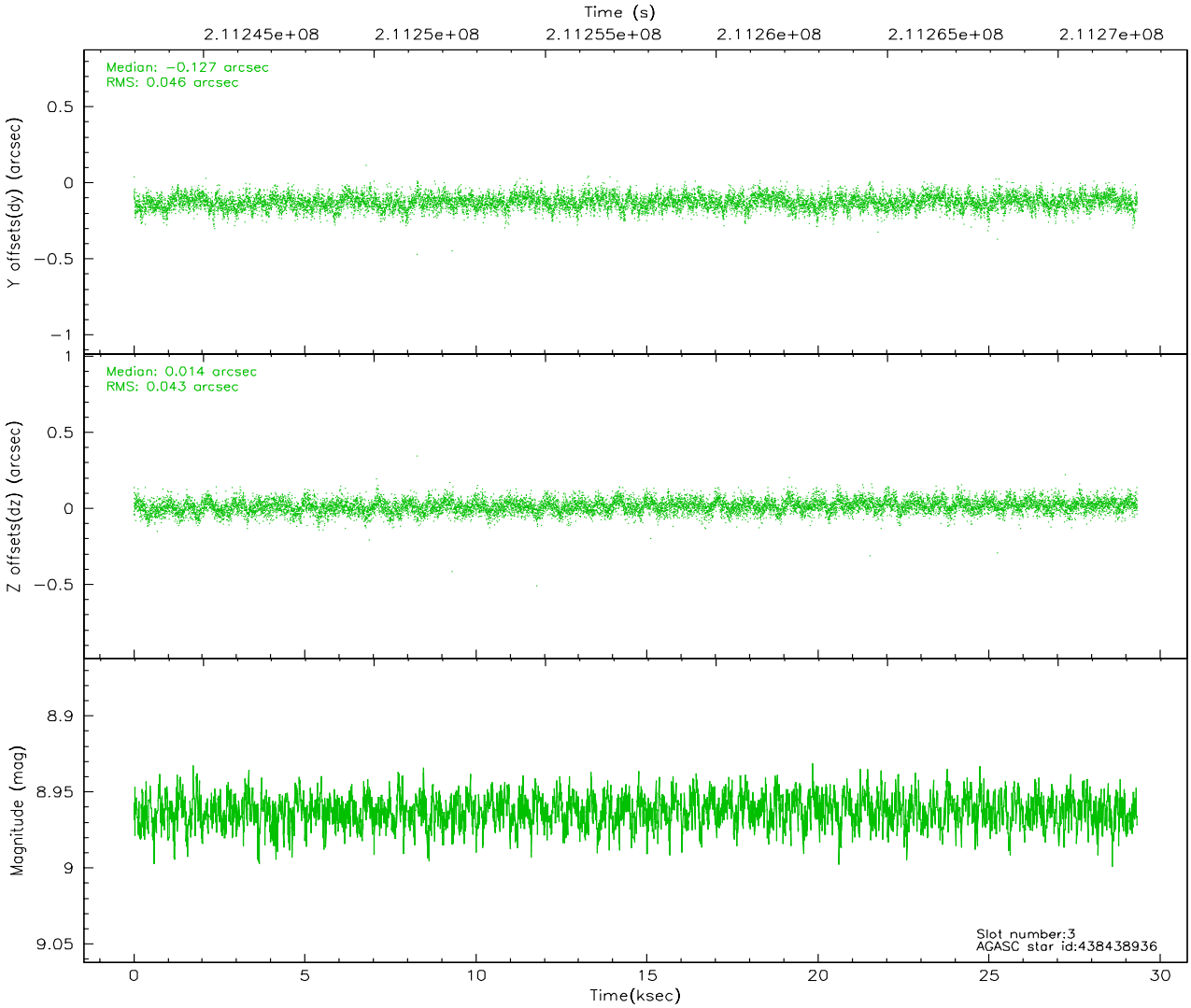
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-1	7.18	7154	0.010	0.002	0.018	0.026	0.000000	0.000000	937.44	-1788.48
1	FID	ACIS-S-4	7.19	7154	0.041	0.000	0.017	0.025	0.000000	0.000000	2154.96	115.56
2	FID	ACIS-S-5	7.23	7154	-0.078	0.011	0.006	0.012	0.000000	0.000000	-1811.38	109.31
3	GUIDE	438438936	8.96	14304	-0.127	0.014	0.067	0.110	78.241026	46.550197	2209.69	2264.28
4	GUIDE	438460832	8.98	14302	0.096	-0.302	0.084	0.136	78.414614	45.554782	-1393.95	2056.70
5	GUIDE	440145944	9.08	14299	0.095	0.261	0.090	0.141	80.083717	45.428844	-2063.24	-2126.15
6	GUIDE	440150048	7.19	14305	-0.149	-0.112	0.059	0.090	79.112838	46.416060	1600.82	134.82
7	GUIDE	440163960	8.90	14302	0.082	0.139	0.083	0.131	79.298370	45.827072	-540.16	-217.10

2.4 Star Slots

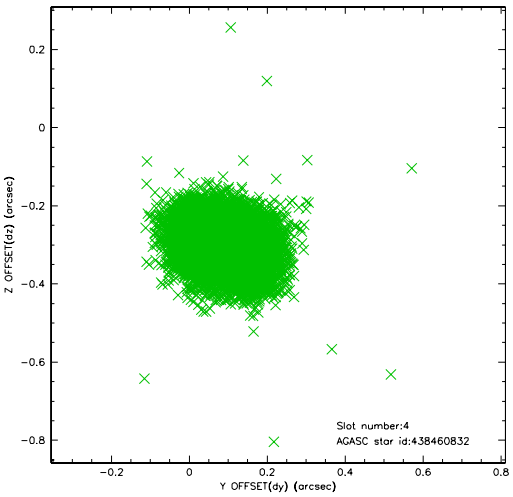
2.4.1 Slot 3

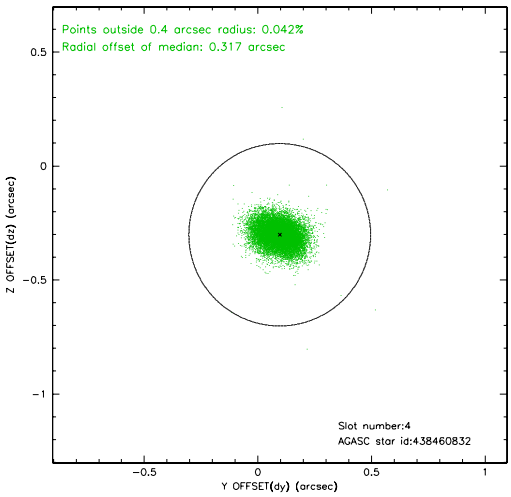


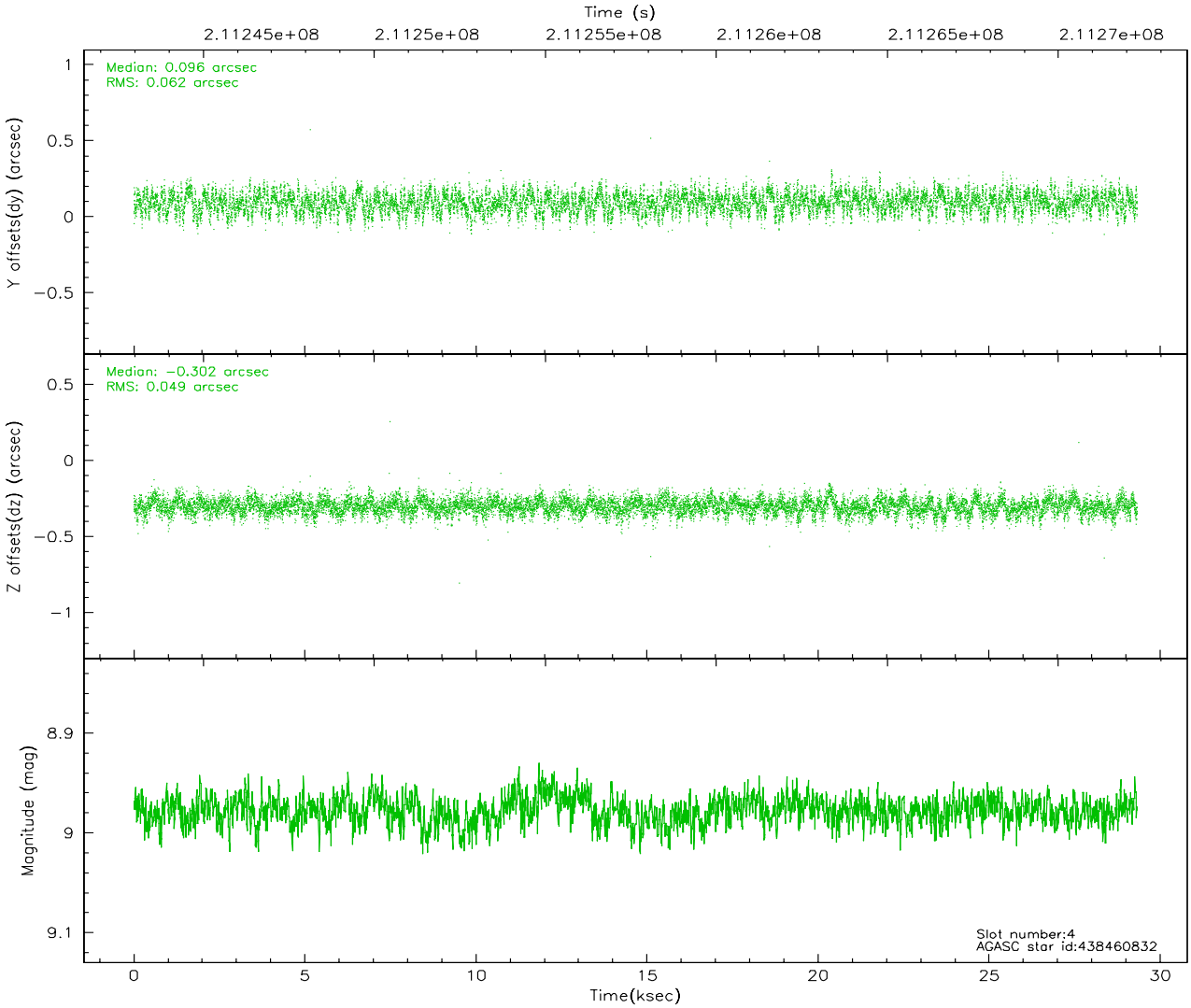




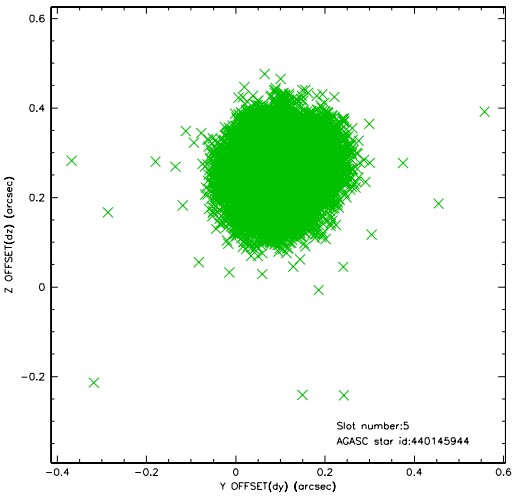
2.4.2 Slot 4

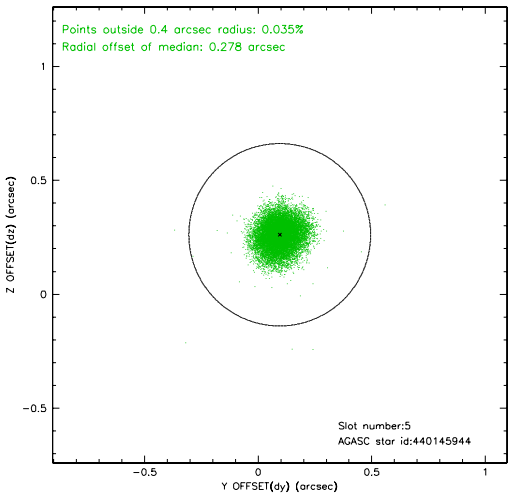

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:4
AGASC star id:438460832

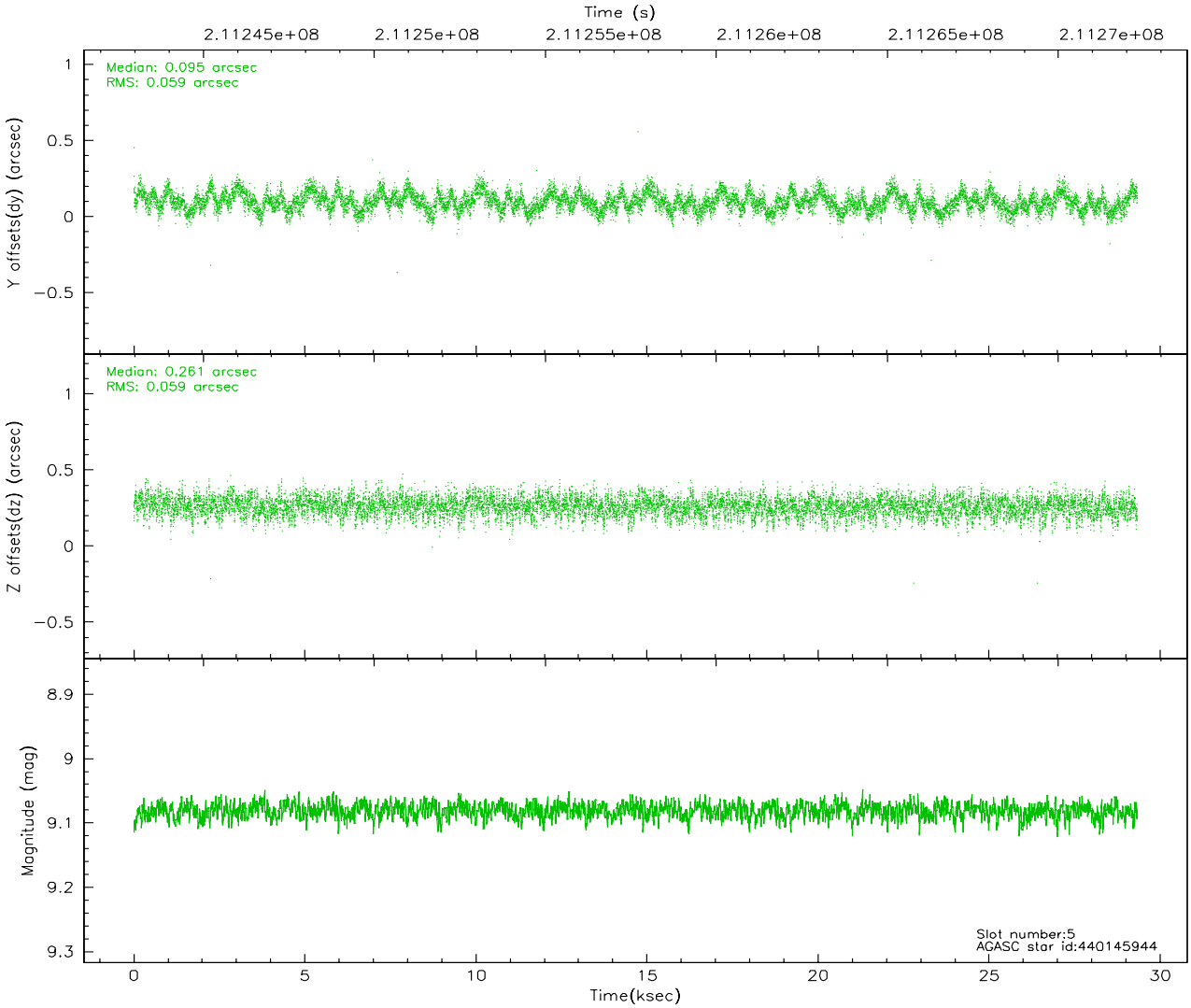

Points outside 0.4 arcsec radius: 0.042%
Radial offset of median: 0.317 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:4
AGASC star id:438460832


Time (s)
2.11245e+08
2.1125e+08
2.11255e+08
2.1126e+08
2.11265e+08
2.1127e+08
Median: 0.096 arcsec
RMS: 0.062 arcsec
Y offsets(dy) (arcsec)
Median: −0.302 arcsec
RMS: 0.049 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:4
AGASC star id:438460832
Time(ksec)

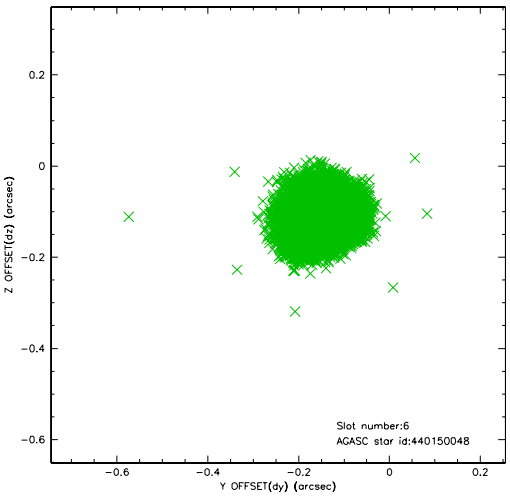
2.4.3 Slot 5

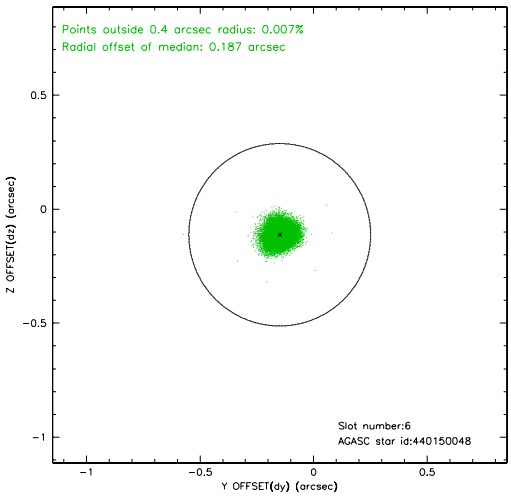

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:5
AGASC star id:440145944

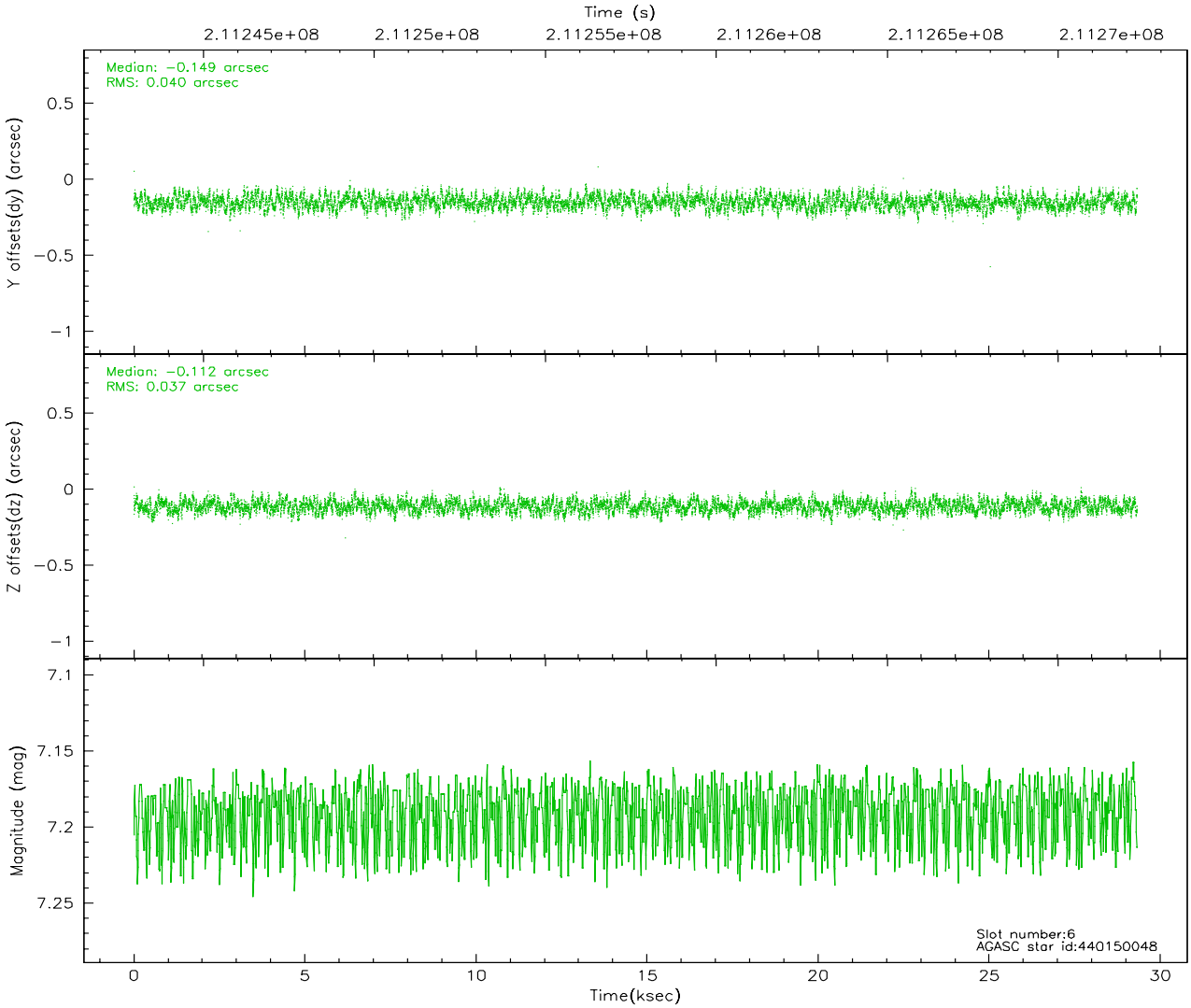

Points outside 0.4 arcsec radius: 0.035%
Radial offset of median: 0.278 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:5
AGASC star id:440145944


Time (s)
Median: 0.095 arcsec
RMS: 0.059 arcsec
Y offsets(dy) (arcsec)
Median: 0.261 arcsec
RMS: 0.059 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:5
AGASC star id:440145944
Time(ksec)

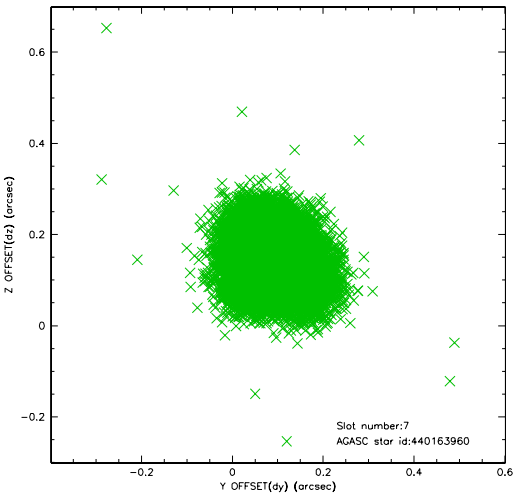
2.4.4 Slot 6

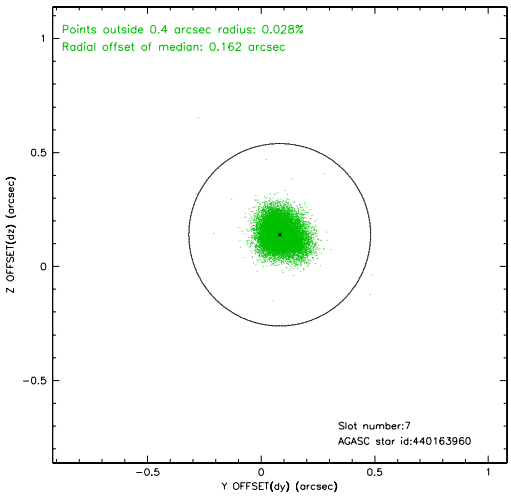

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:6
AGASC star id:440150048

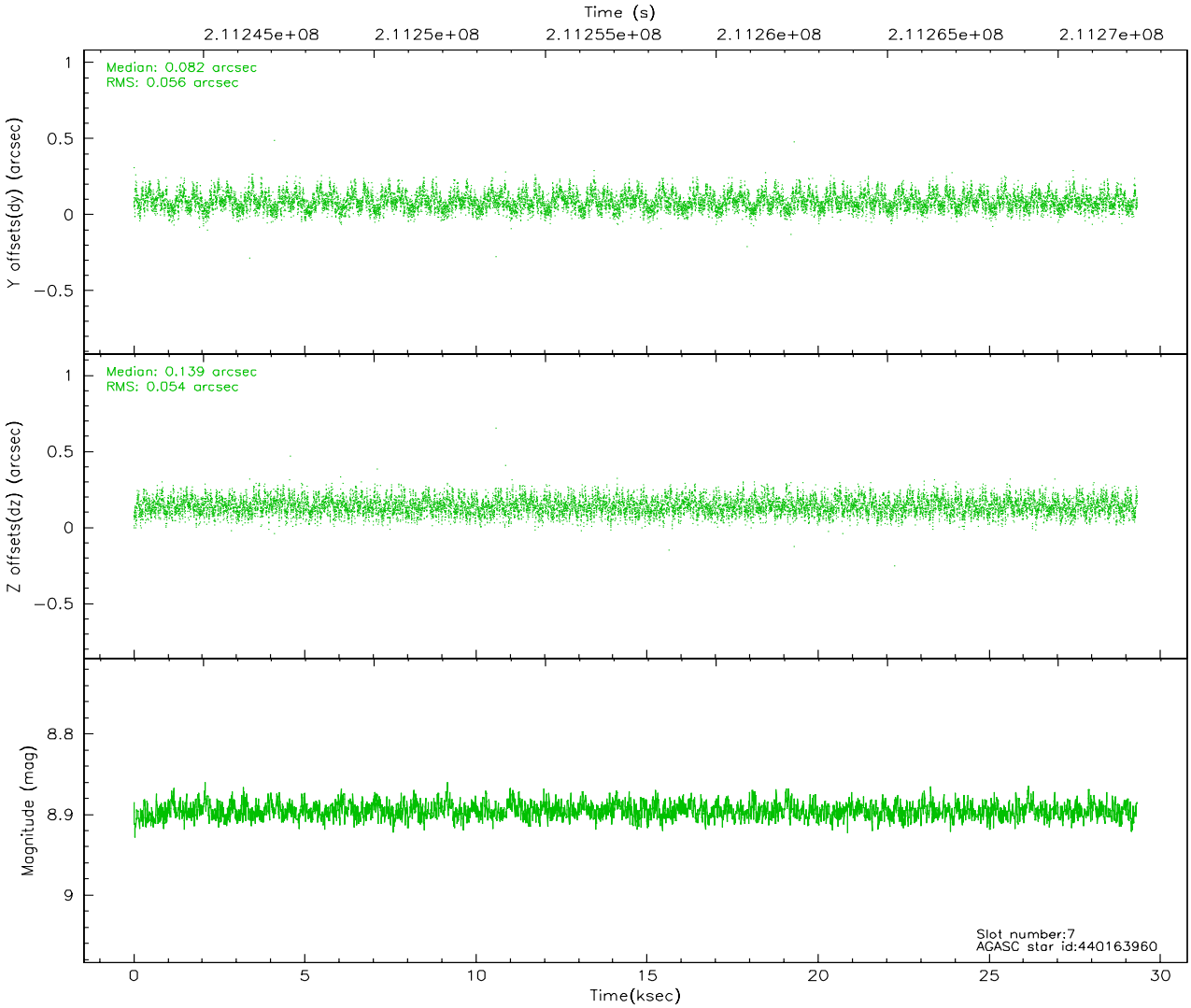

Points outside 0.4 arcsec radius: 0.007%
Radial offset of median: 0.187 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:6
AGASC star id:440150048


Time (s)
2.11245e+08
2.1125e+08
2.11255e+08
2.1126e+08
2.11265e+08
2.1127e+08
Median: −0.149 arcsec
RMS: 0.040 arcsec
Y offsets(dy) (arcsec)
Median: −0.112 arcsec
RMS: 0.037 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:6
AGASC star id:440150048
Time(ksec)

2.4.5 Slot 7

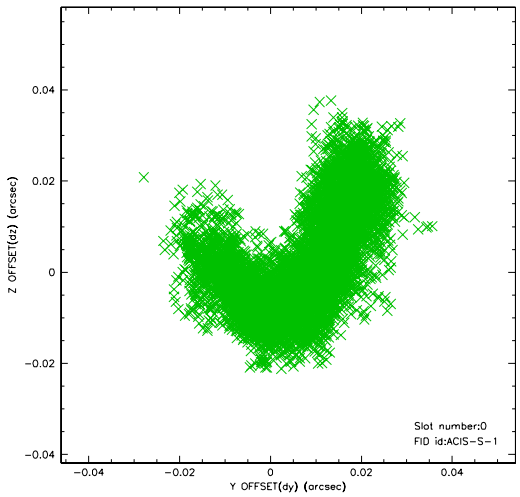

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:7
AGASC star id:440163960

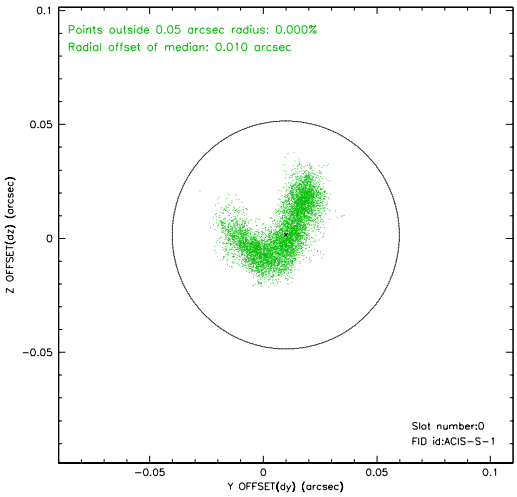

Points outside 0.4 arcsec radius: 0.028%
Radial offset of median: 0.162 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:7
AGASC star id:440163960

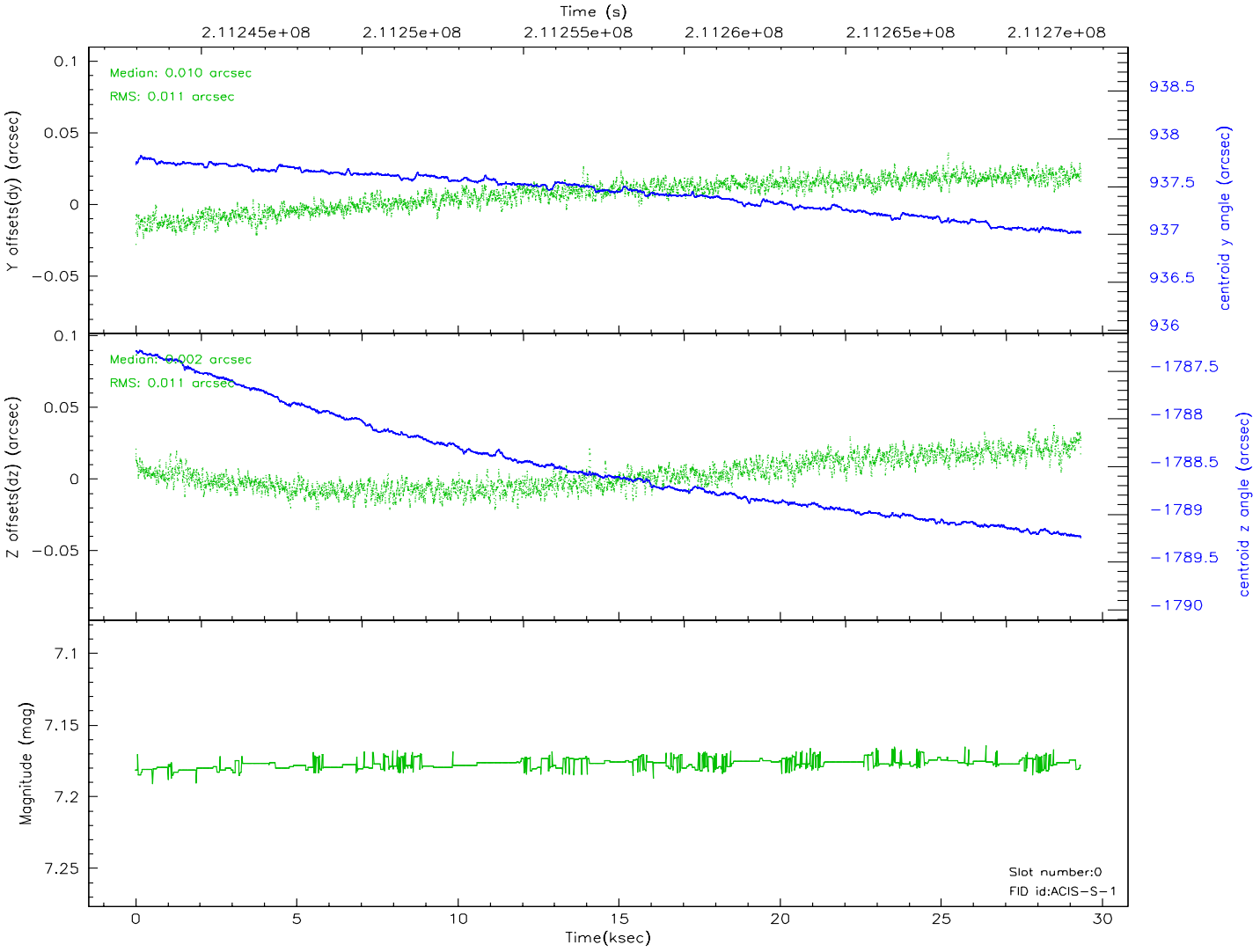

Time (s)
Median: 0.082 arcsec
RMS: 0.056 arcsec
Y offsets(dy) (arcsec)
Median: 0.139 arcsec
RMS: 0.054 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:7
AGASC star id:440163960
Time(ksec)

2.5 FID Slots

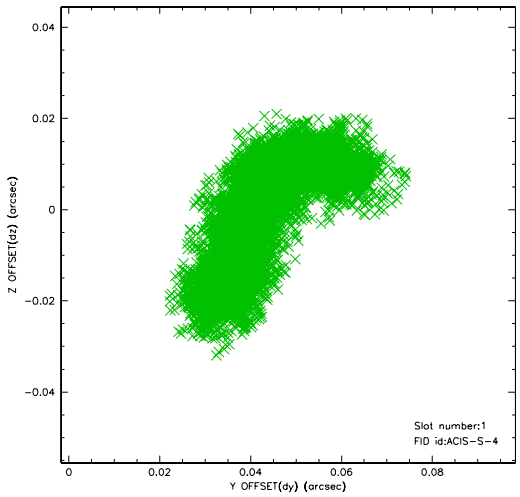
2.5.1 Slot 0

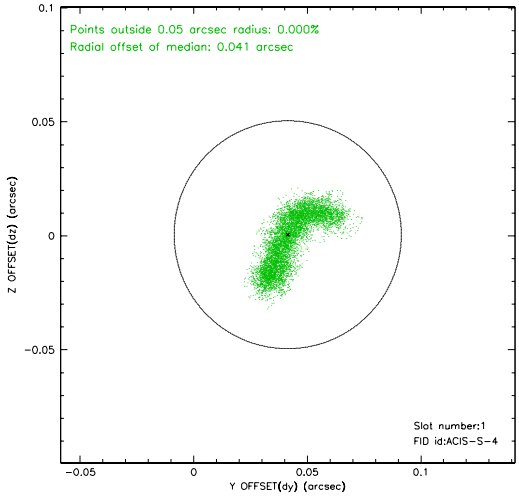


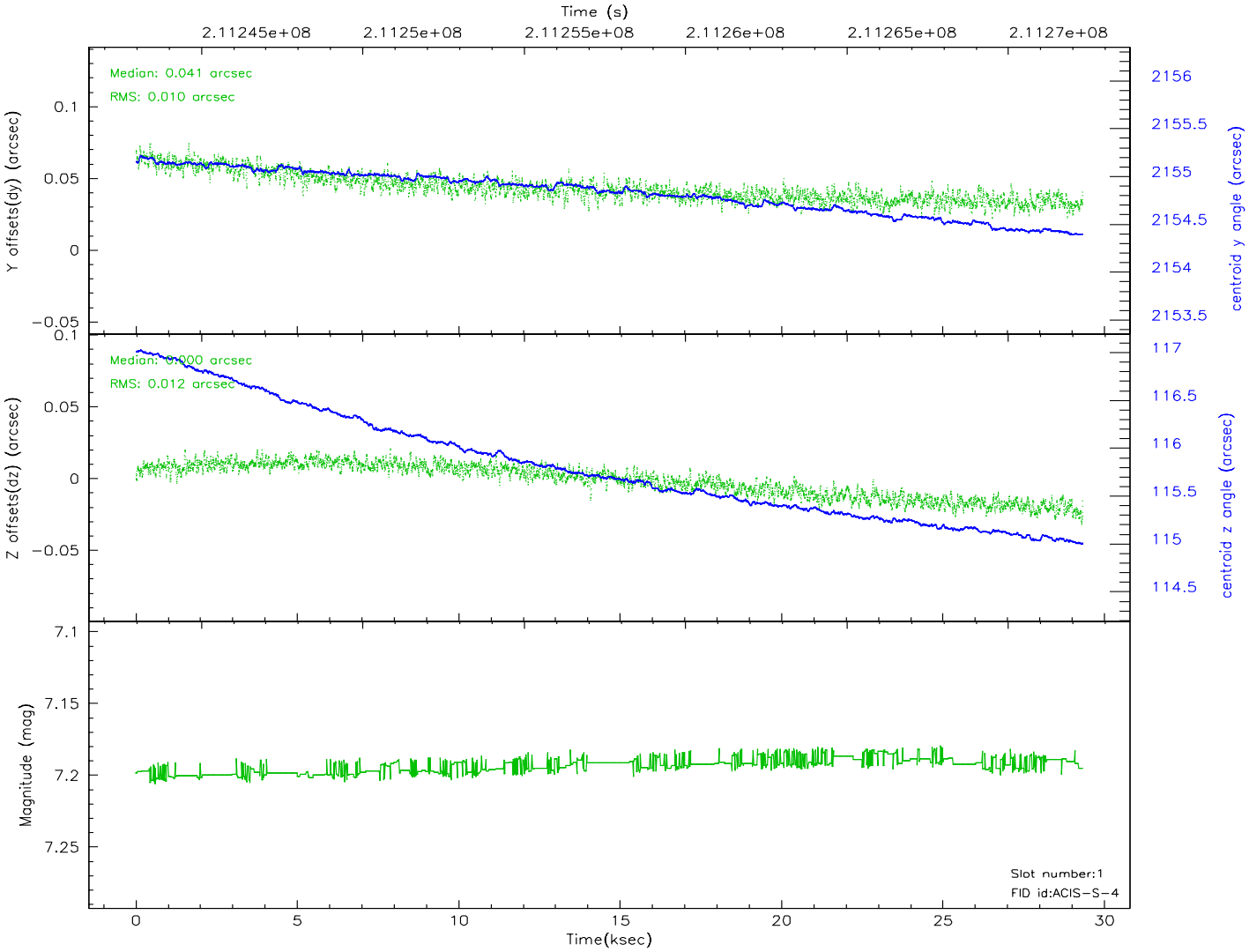




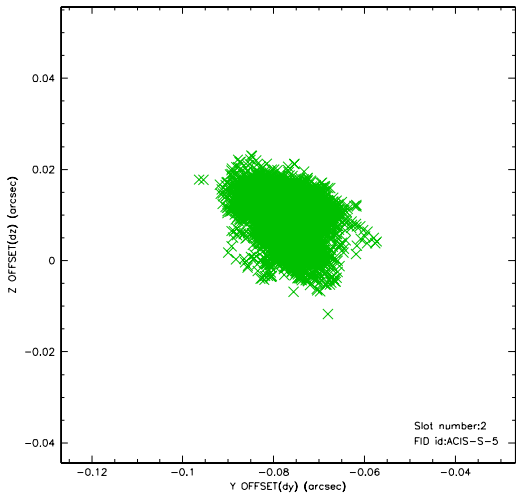
2.5.2 Slot 1

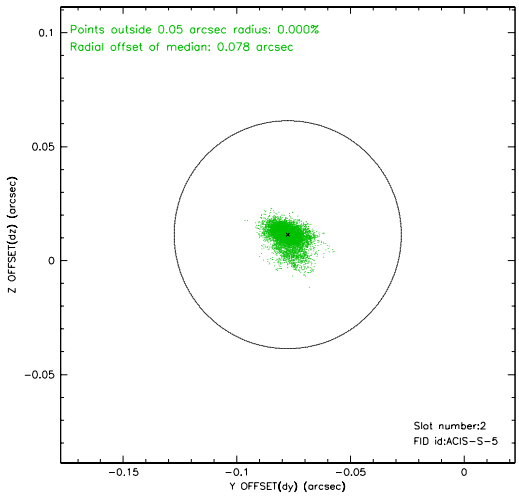

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:1
FID id:ACIS-S-4

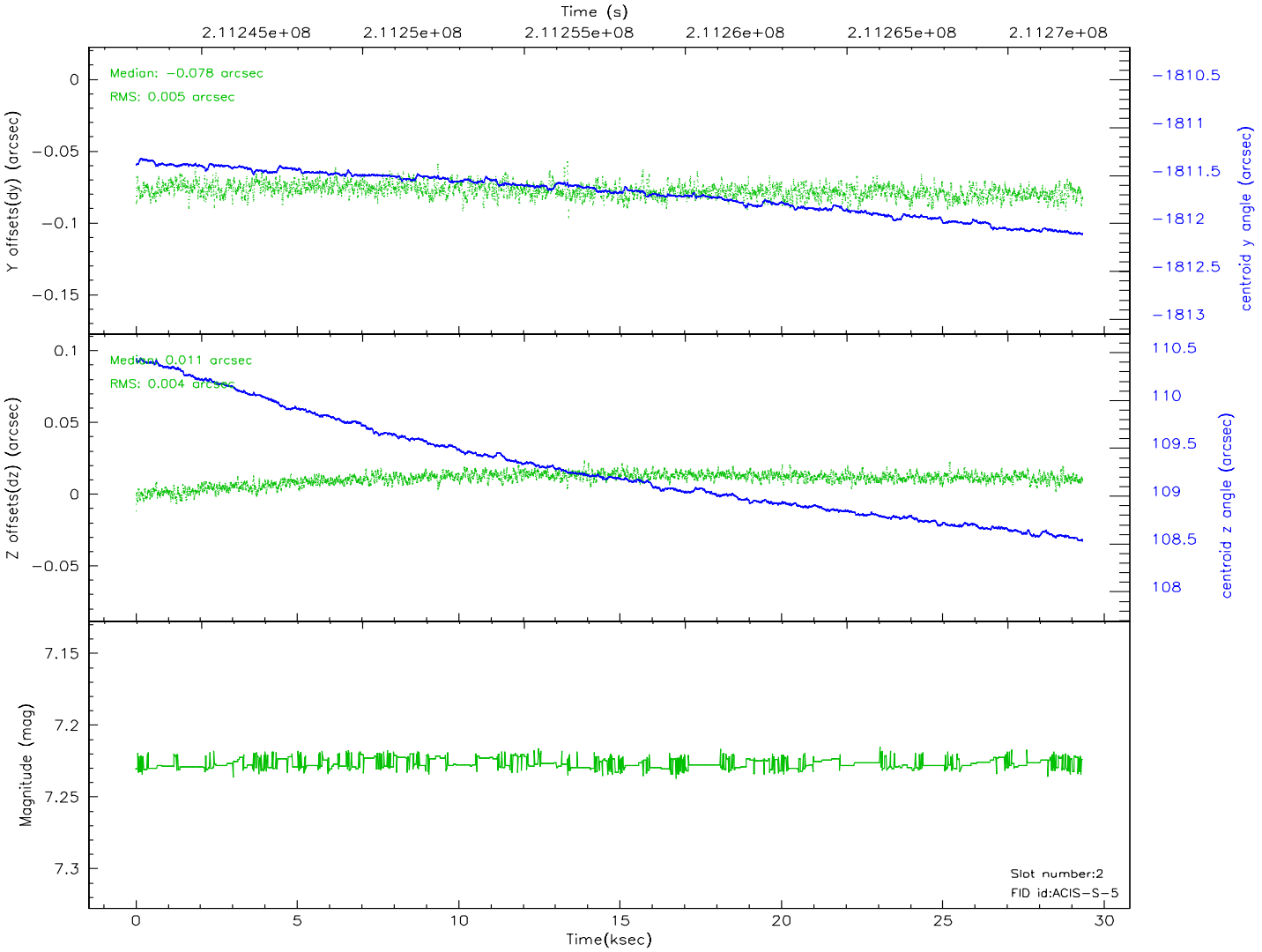

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.041 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:1
FID id:ACIS-S-4


Time (s)
Median: 0.041 arcsec
RMS: 0.010 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.000 arcsec
RMS: 0.012 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

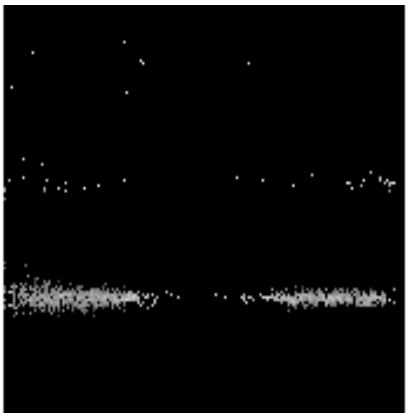

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:2
FID id:ACIS-S-5


Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.078 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:2
FID id:ACIS-S-5

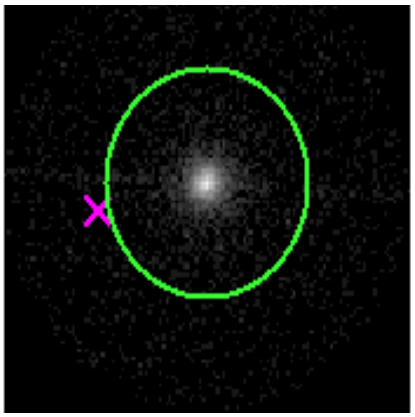

Time (s)
Median: −0.078 arcsec
RMS: 0.005 arcsec
Y offsets(dy) (arcsec)
Median: 0.011 arcsec
RMS: 0.004 arcsec
Z offsets(dz) (arcsec)
centroid y angle (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number:2
FID id:ACIS-S-5
Time(ksec)

3 Gratings

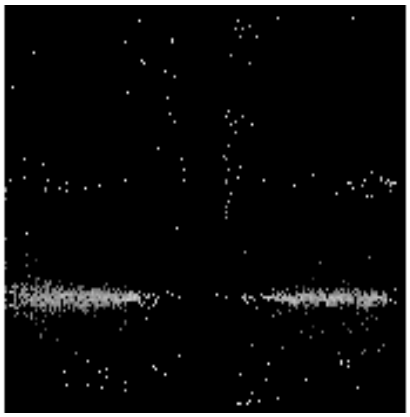
3.1 HEG Arm



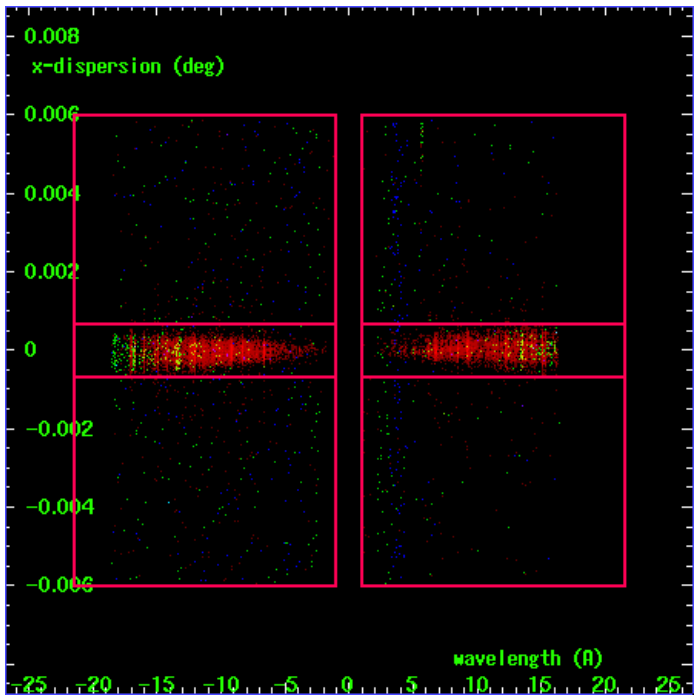
HEG Order Sort 123



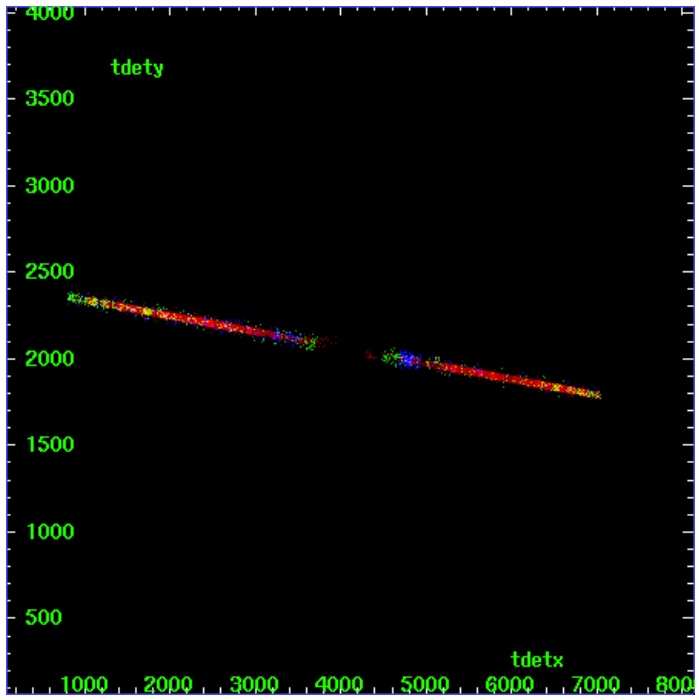
HEG Zero Order



HEG Order Sort ALL

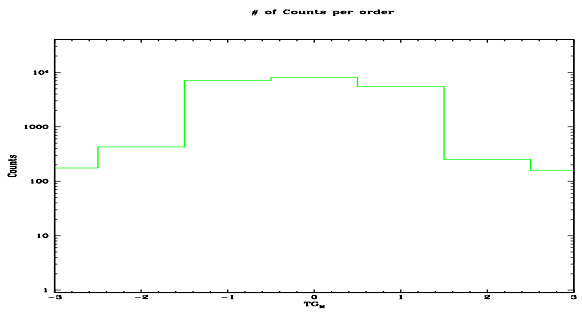


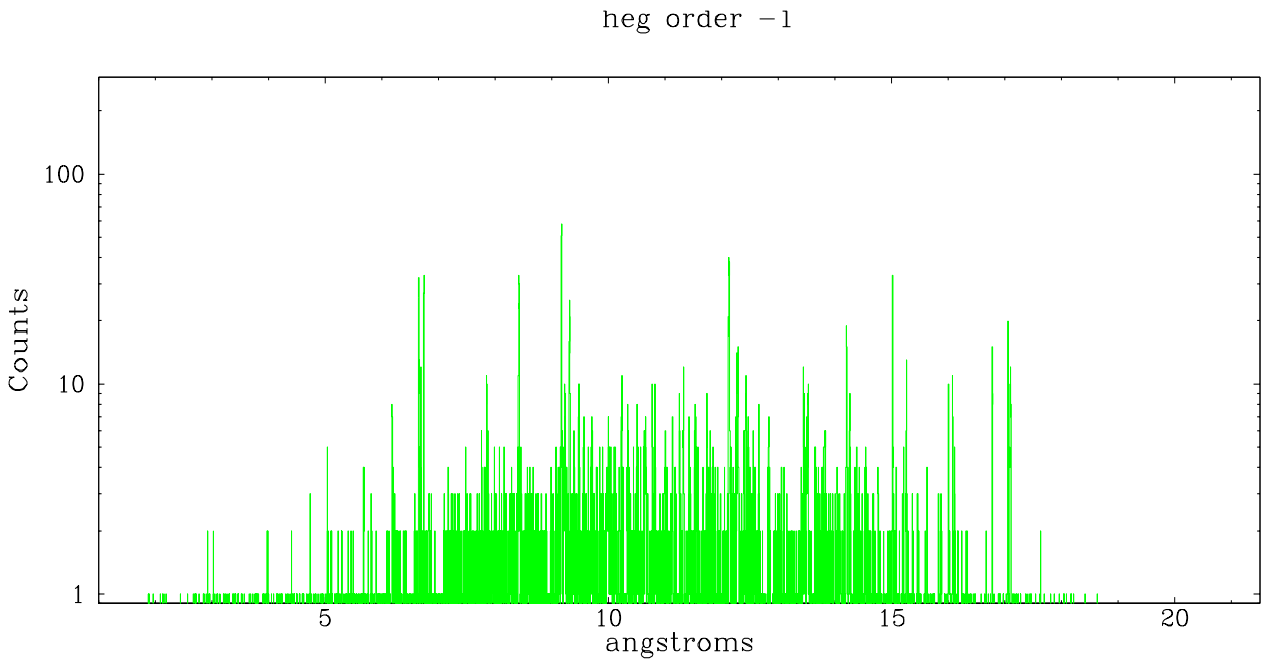
Spot Image HEG

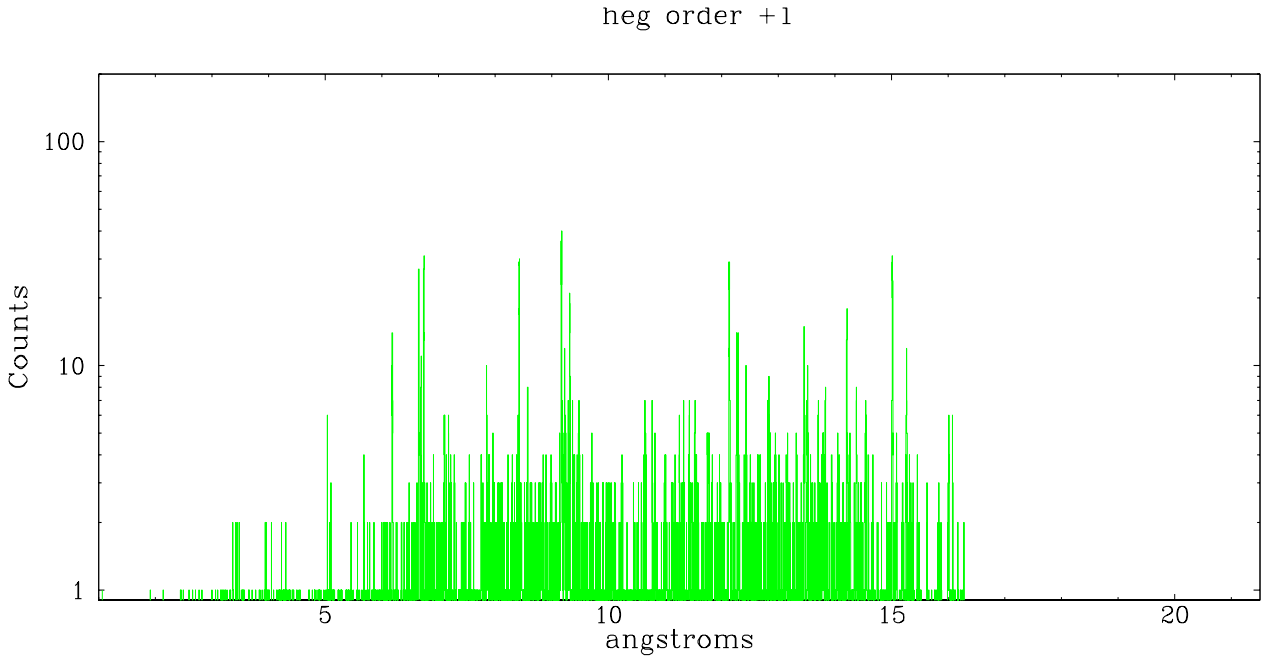


Full Detector HEG

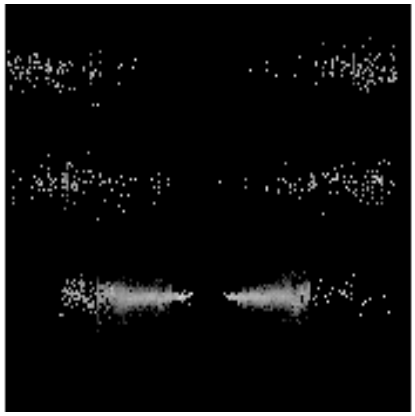
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	175	427	7100	7984	5461	253	159



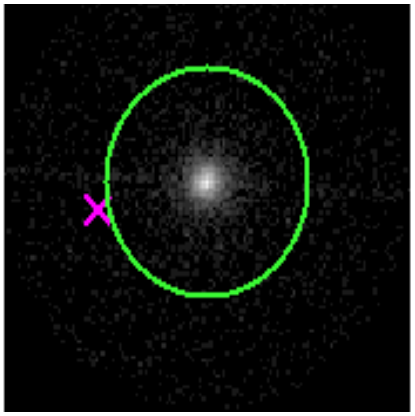

heg order −1
Counts
100
10
1
5
10
15
20
angstroms


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

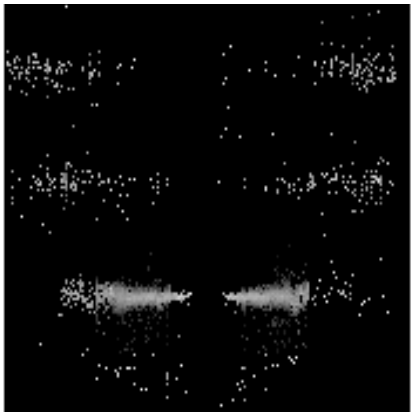
3.2 MEG Arm



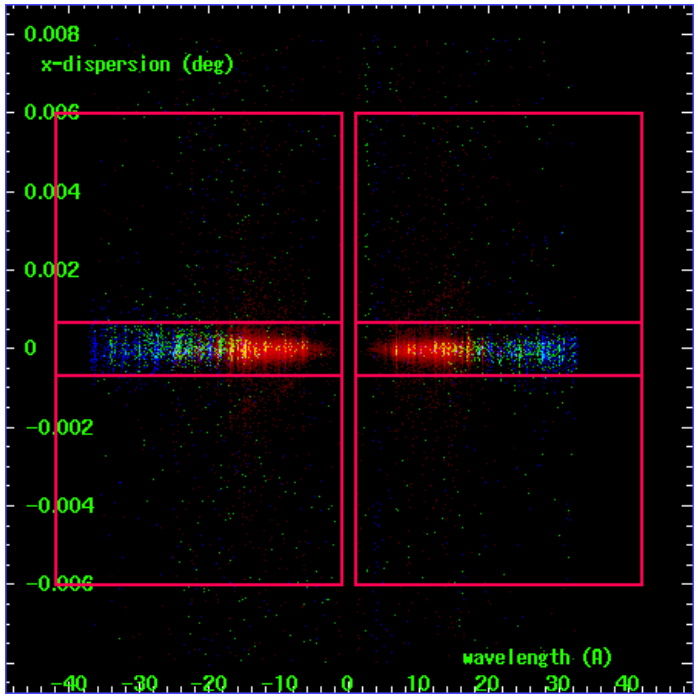
MEG Order Sort 123



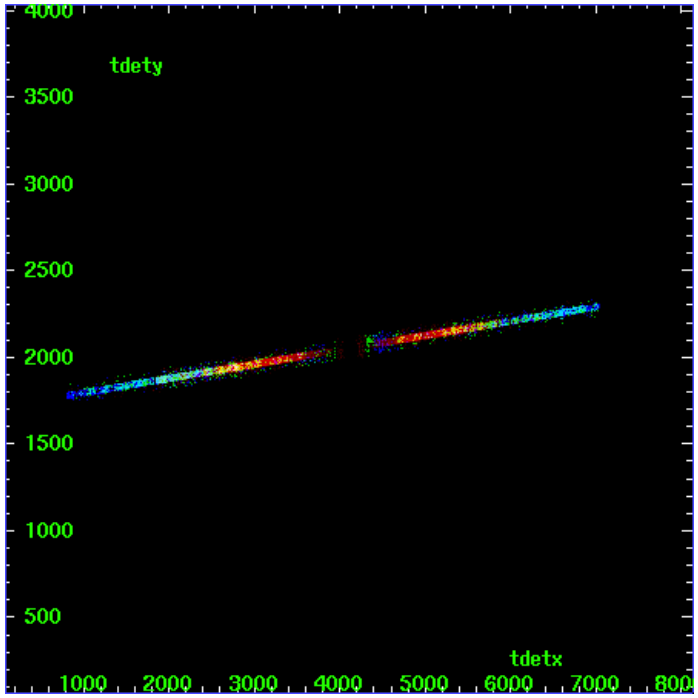
MEG Zero Order



MEG Order Sort ALL

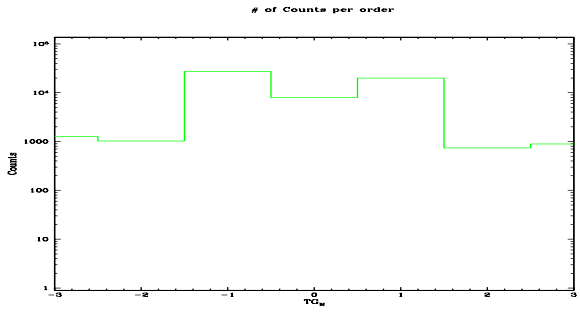


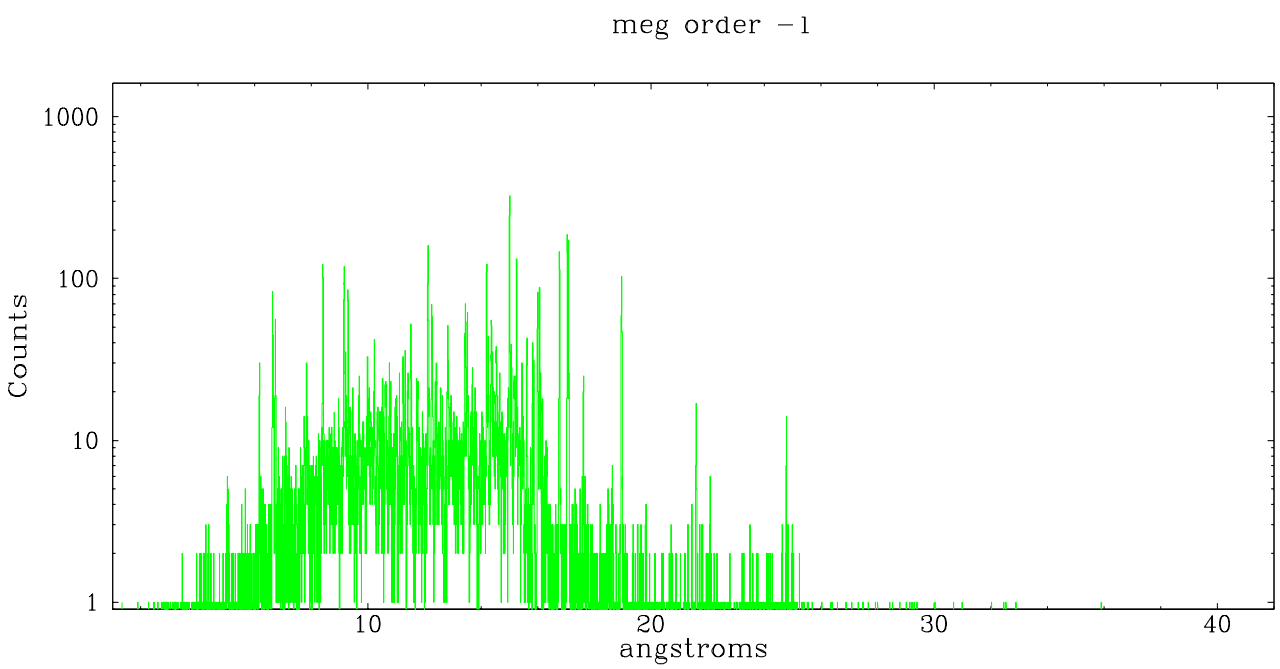
Spot Image MEG

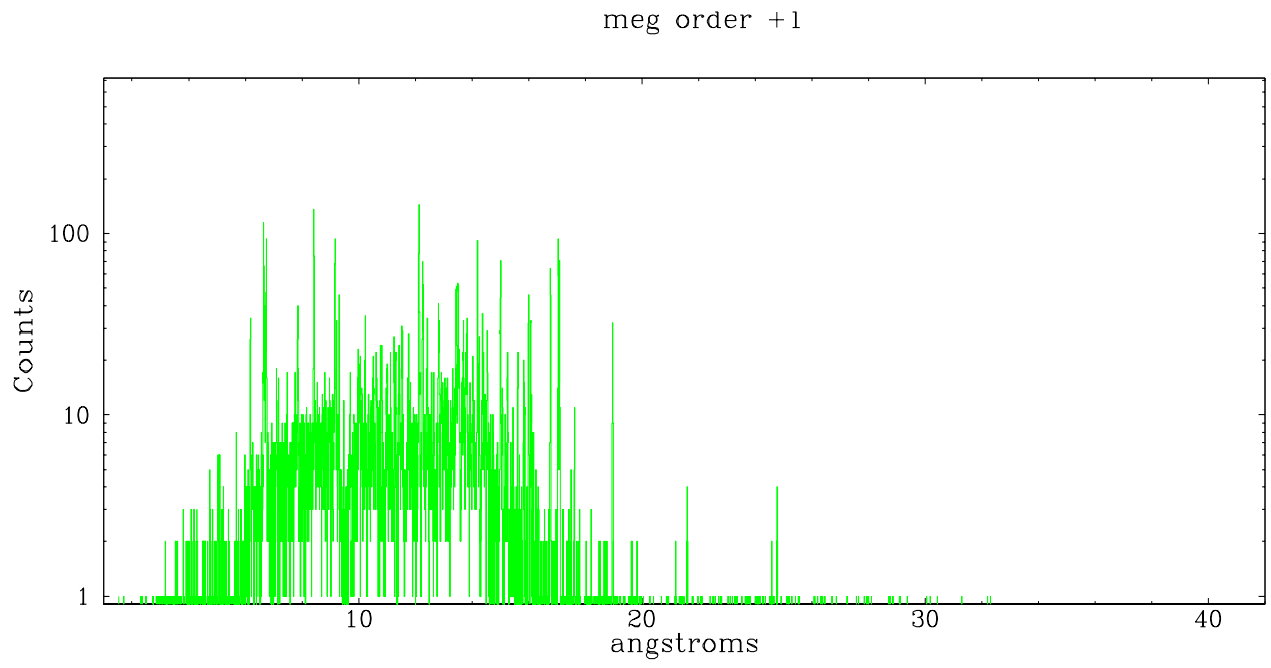


Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	1269	1029	27267	7984	19998	742	889




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


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

A Summary

A.1 Status

V&V Scientist	Jen Lauer
V&V Date (YYYY-MM-DD)	2006.04.17
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	29.142

A.2 Comments

```
Window constraint met.
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