V&V Reference Report
L2 ASCDS Version : 8.4.4

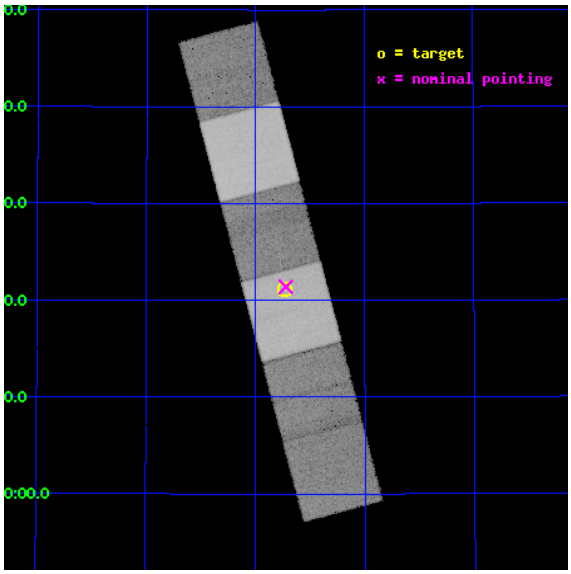
Observation 9941 - L2 Version 2
Chandra X-Ray Center

L2 Processing Date : Jun 3 2012

Contents

1 Front

seq_num	200556	Sequence number
obs_id	9941	Observation id
title	Testing the Colliding Wind Paradigm: X-rays from the Wolf-Rayet Binary System WR 147	Proposal title
observer	Dr Svetozar ZHEKOV	Principal investigator
object	WR 147	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	309.182083	Observer's specified target RA [deg]
dec_targ	40.352028	Observer's specified target Dec [deg]
ra_nom	309.18026095005	Nominal RA [deg]
dec_nom	40.356662281721	Nominal Dec [deg]
roll_nom	75.157812156077	Nominal Roll [deg]
revision	2	Processing version of data
ontime	28745.599892974	Sum of GTIs [s]
livetime	28381.605798607	Livetime [s]
ontime4	28745.599892974	Sum of GTIs [s]
ontime5	28745.599892974	Sum of GTIs [s]
ontime6	28745.599892974	Sum of GTIs [s]
ontime7	28745.599892974	Sum of GTIs [s]
ontime8	28745.599892974	Sum of GTIs [s]
ontime9	28745.599892974	Sum of GTIs [s]
l2events	506045	Number of level 2 events

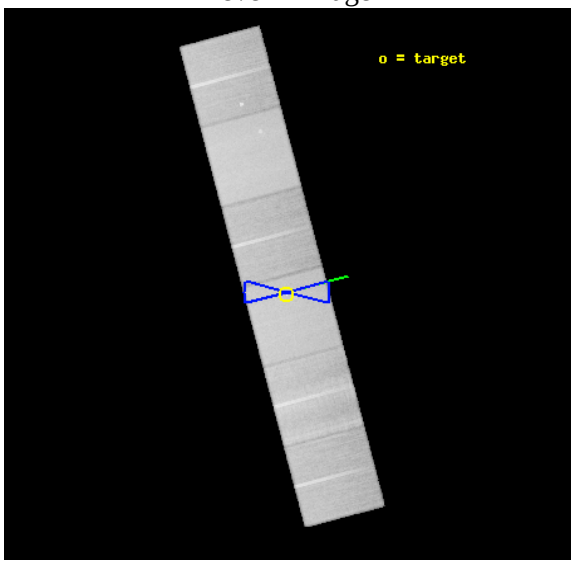


2 OBI

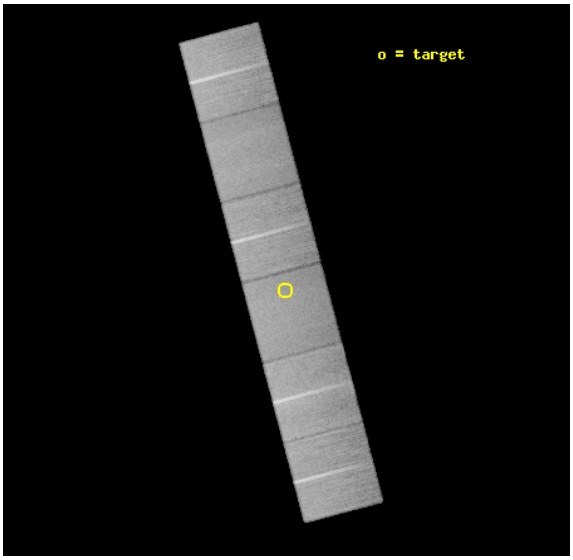
2.1 OBI

2.1.1 Images

Level 1 Image

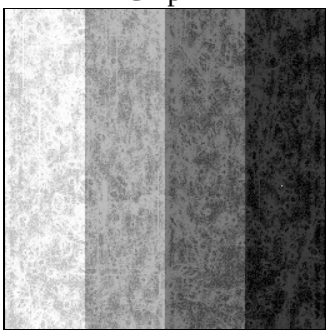


Level 1 Bad Events

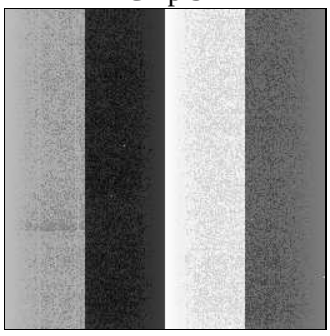


2.1.2 Bias

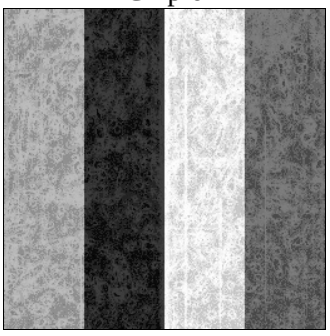
Chip 4



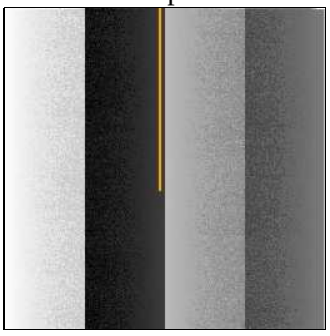
Chip 5



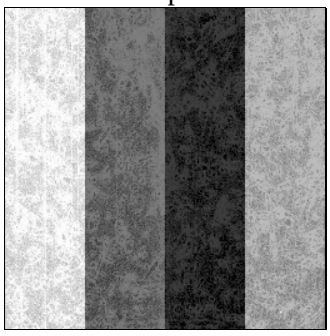
Chip 6



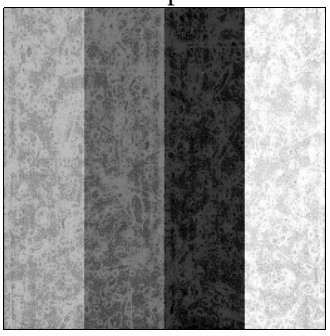
Chip 7



Chip 8



Chip 9



2.1.3 Parameters

obi_num	0	Obi number
ascdsver	8.4.4	Processing system revision
caldbver	4.4.9	
date	2012-06-03T07:23:58	Date and time of file creation
revision	2	Processing version of data

sched_exp_time	28800.000000	[s] Scheduled observation exposure time
ontime	28745.599892974	Sum of GTIs [s]
ontime4	28745.599892974	Sum of GTIs [s]
ontime5	28745.599892974	Sum of GTIs [s]
ontime6	28745.599892974	Sum of GTIs [s]
ontime7	28745.599892974	Sum of GTIs [s]
ontime8	28745.599892974	Sum of GTIs [s]
ontime9	28745.599892974	Sum of GTIs [s]
l1events	2207527	Number of level 1 events

2.1.4 Events

	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	339463	460726	301900	418561	384142	302735
rejected events	298800	252355	265150	243611	295160	264935
rejected %	88%	54%	87%	58%	76%	87%

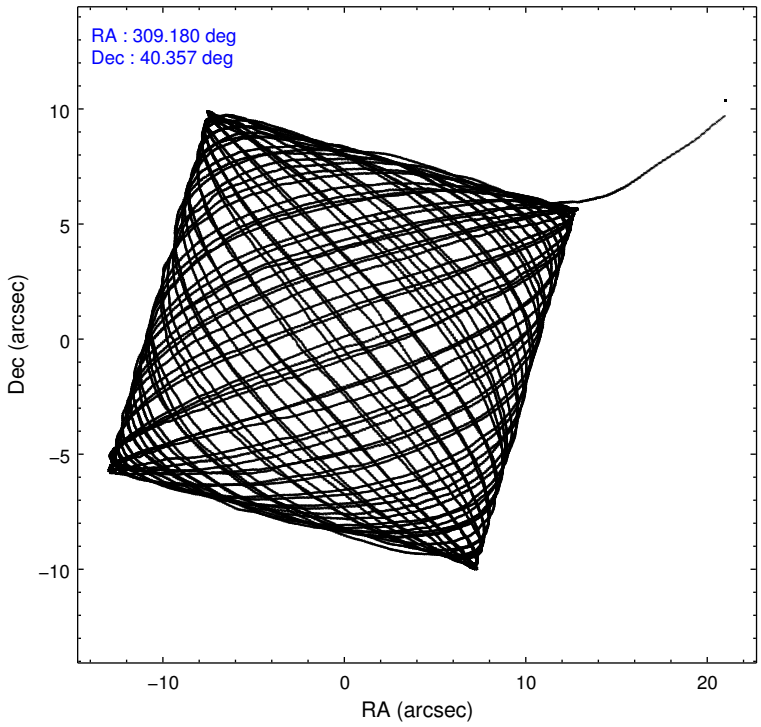
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
grade 0 events	18747	11857	14177	14450	27686	15365
	5%	2%	4%	3%	7%	5%
grade 1 events	359	592	165	438	308	172
	0%	0%	0%	0%	0%	0%
grade 2 events	8335	66343	8383	36009	20226	7858
	2%	14%	2%	8%	5%	2%
grade 3 events	3784	7575	3323	14740	9335	3620
	1%	1%	1%	3%	2%	1%
grade 4 events	3701	7400	3351	14353	8524	3514
	1%	1%	1%	3%	2%	1%
grade 5 events	14416	33036	14487	39246	19495	15418
	4%	7%	4%	9%	5%	5%
grade 6 events	6099	115214	7518	95417	23219	7445
	1%	25%	2%	22%	6%	2%
grade 7 events	284022	218709	250496	203908	275349	249343
	83%	47%	82%	48%	71%	82%

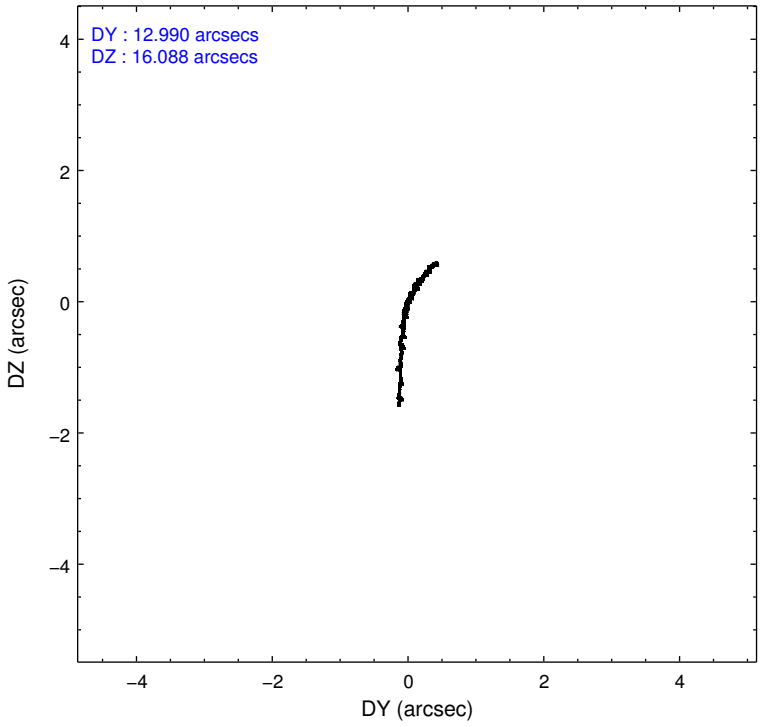
2.2 Compared Parameters

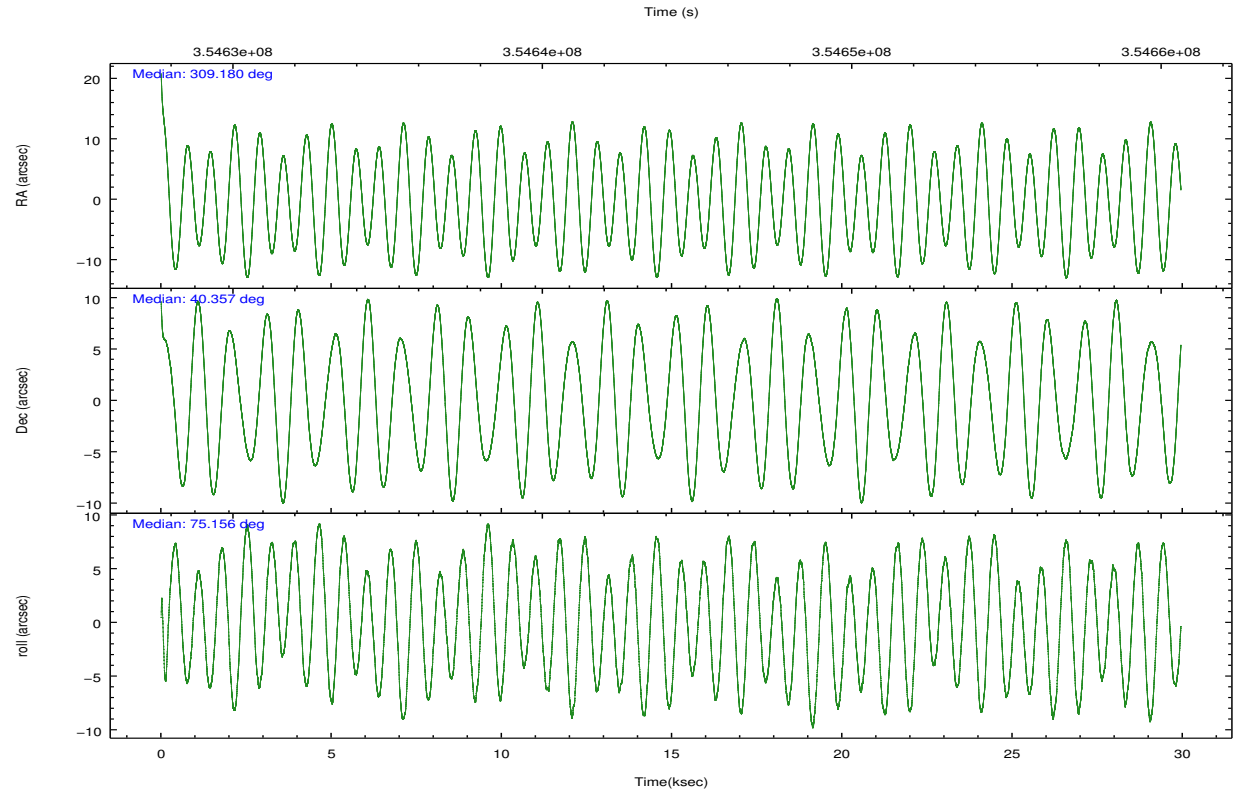
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-456789	ACIS-456789
Grating	HETG	HETG
Data mode	FAINT	FAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	309.190090	309.1802609500484
[deg] Pointing Dec	40.330378	40.35666228172141
[deg] Pointing Roll	74.994819	75.15781215607666
[deg] Roll angle	90.000000	90.000000
[deg] Roll tolerance	15.000000	15.000000
Roll constraint allows 180D rotation	Y	Y
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-190.132523	-190.1400660498719
[mm] SIM translation stage offset	0	0.00754346686406393
[s] Observation start time (MET)	354630346.184000	354628100.16822
Observation start date	2009-03-28T12:24:40	2009-03-28T11:48:20
[s] Observation end time (MET)	354659146.184000	354659730.13229
Observation end date	2009-03-28T20:24:40	2009-03-28T20:35:30
Read mode	TIMED	TIMED

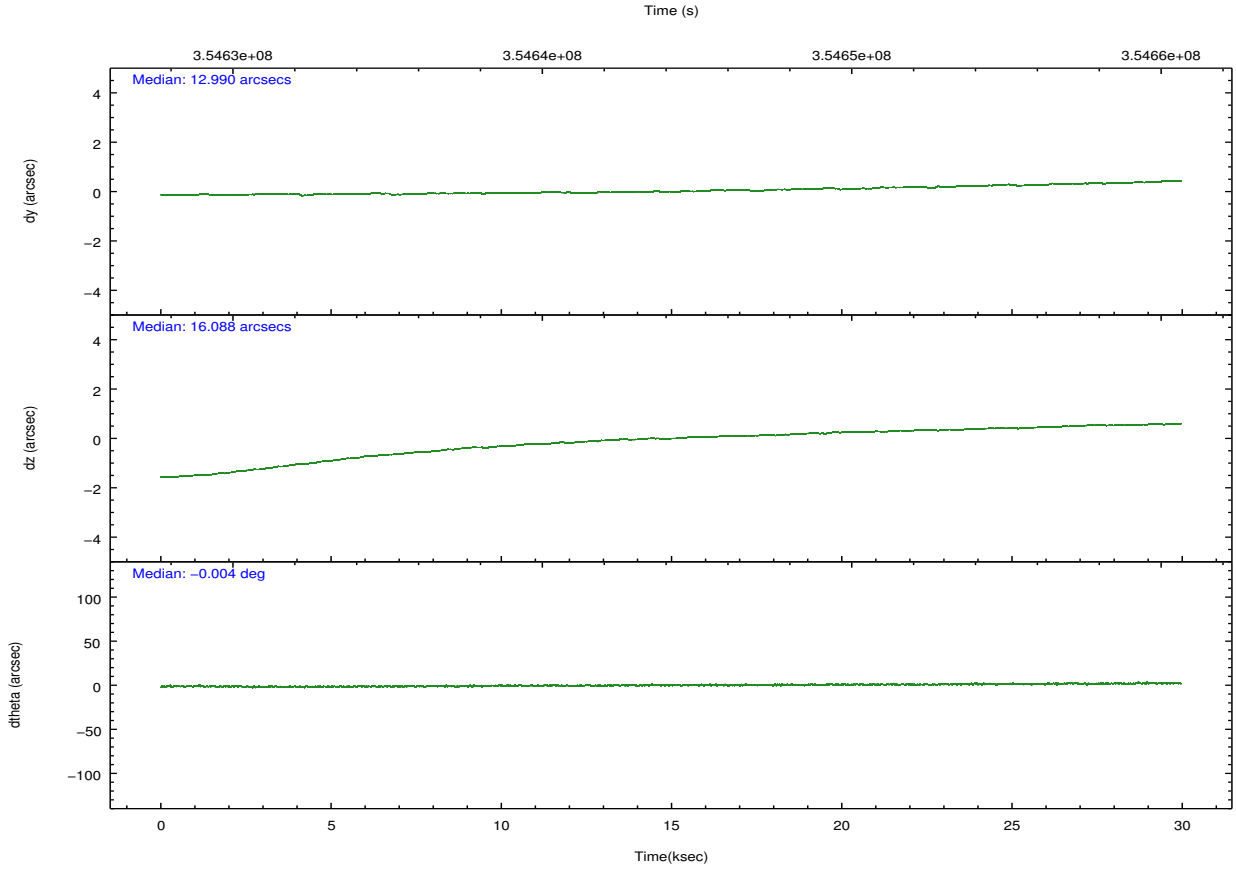
Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
CCD I0 on	N	N
CCD I1 on	N	N
CCD I2 on	N	N
CCD I3 on	N	N
CCD S0 on	O1	Y
CCD S1 on	Y	Y
CCD S2 on	Y	Y
CCD S3 on	Y	Y
CCD S4 on	Y	Y
CCD S5 on	O2	Y
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	NONE	NONE
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	3.2

2.3 Aspect


RA : 309.180 deg
Dec : 40.357 deg
10
5
0
−5
−10
Dec (arcsec)
−10
0
10
20
RA (arcsec)


DY : 12.990 arcsecs
DZ : 16.088 arcsecs
4
2
0
−2
−4
DZ (arcsec)
−4
−2
0
2
4
DY (arcsec)


Time (s)
3.5463e+08
3.5464e+08
3.5465e+08
3.5466e+08
Median: 309.180 deg
RA (arcsec)
Median: 40.357 deg
Dec (arcsec)
Median: 75.156 deg
roll (arcsec)
Time(ksec)

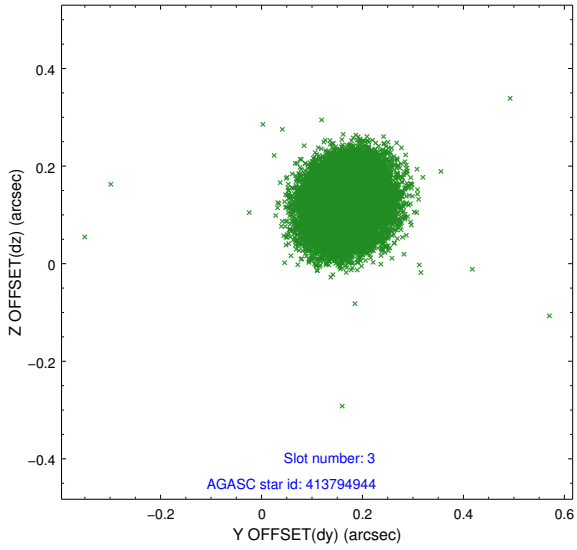

Time (s)
3.5463e+08
3.5464e+08
3.5465e+08
3.5466e+08
Median: 12.990 arcsecs
dy (arcsec)
Median: 16.088 arcsecs
dz (arcsec)
Median: −0.004 deg
dtheta (arcsec)
Time(ksec)

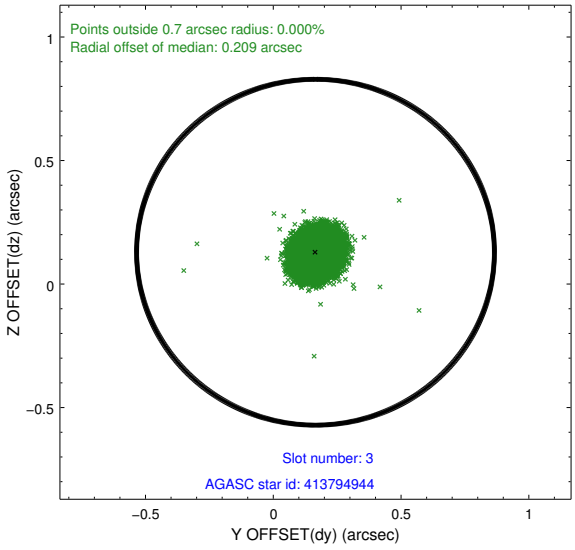
Slot Statistics

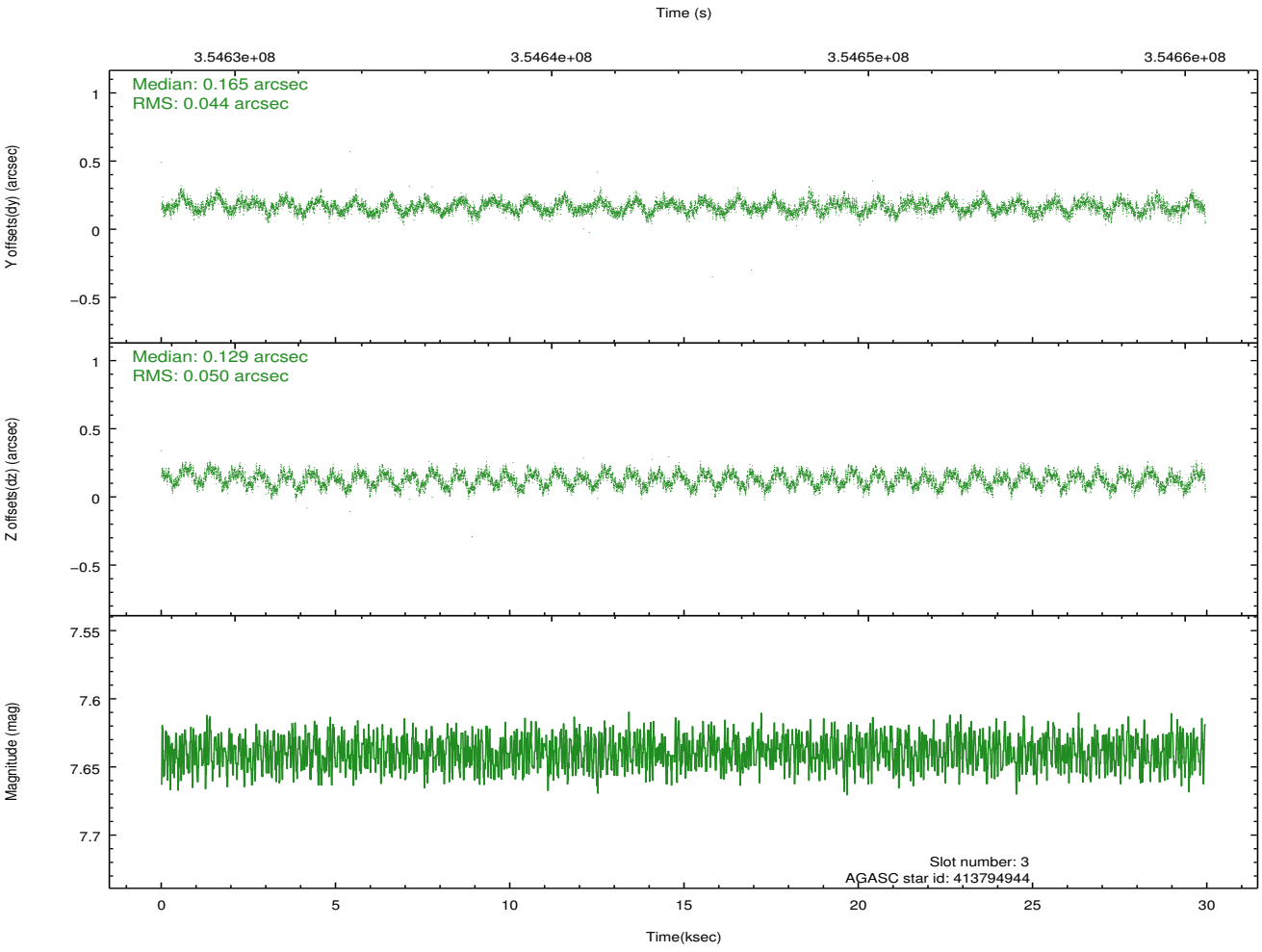
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	6.89	7306	-0.076	-0.050	0.008	0.016	0.000000	0.000000	-766.05	-1737.37
1	FID	ACIS-S-4	6.98	7306	0.106	0.027	0.008	0.017	0.000000	0.000000	2147.39	171.11
2	FID	ACIS-S-6	7.11	7305	-0.057	0.030	0.009	0.024	0.000000	0.000000	396.06	808.59
3	GUIDE	413794944	7.64	14604	0.165	0.129	0.072	0.108	309.554319	39.690543	-1961.52	-1570.06
4	GUIDE	413797136	7.91	14607	-0.043	0.071	0.058	0.092	309.356621	39.806092	-1703.53	-933.27
5	GUIDE	413799600	8.56	14602	0.025	-0.070	0.077	0.126	308.280373	39.866891	-2250.20	1999.41
6	GUIDE	413803744	8.83	14600	-0.095	-0.074	0.088	0.139	308.586342	40.704904	881.13	1942.31
7	GUIDE	413798232	8.30	14597	-0.053	-0.050	0.062	0.099	309.116117	41.044272	2430.25	859.89

2.4 Star Slots

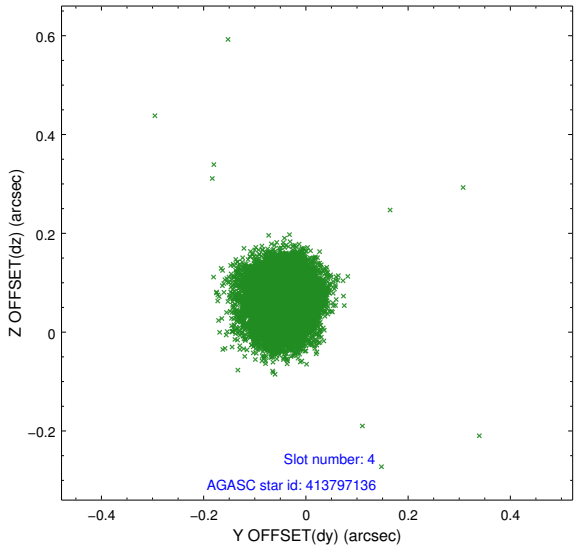
2.4.1 Slot 3

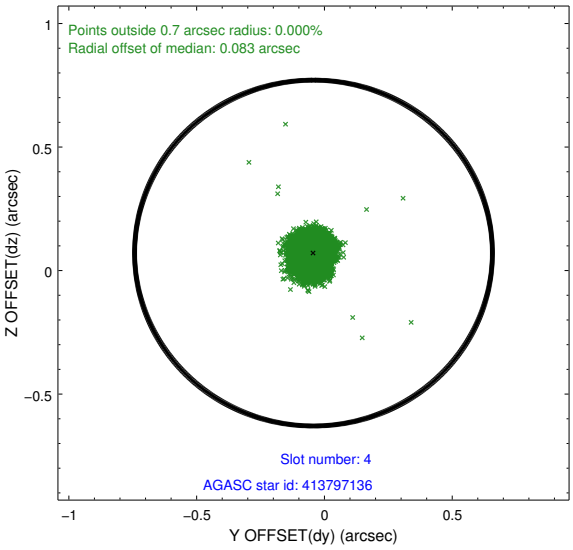


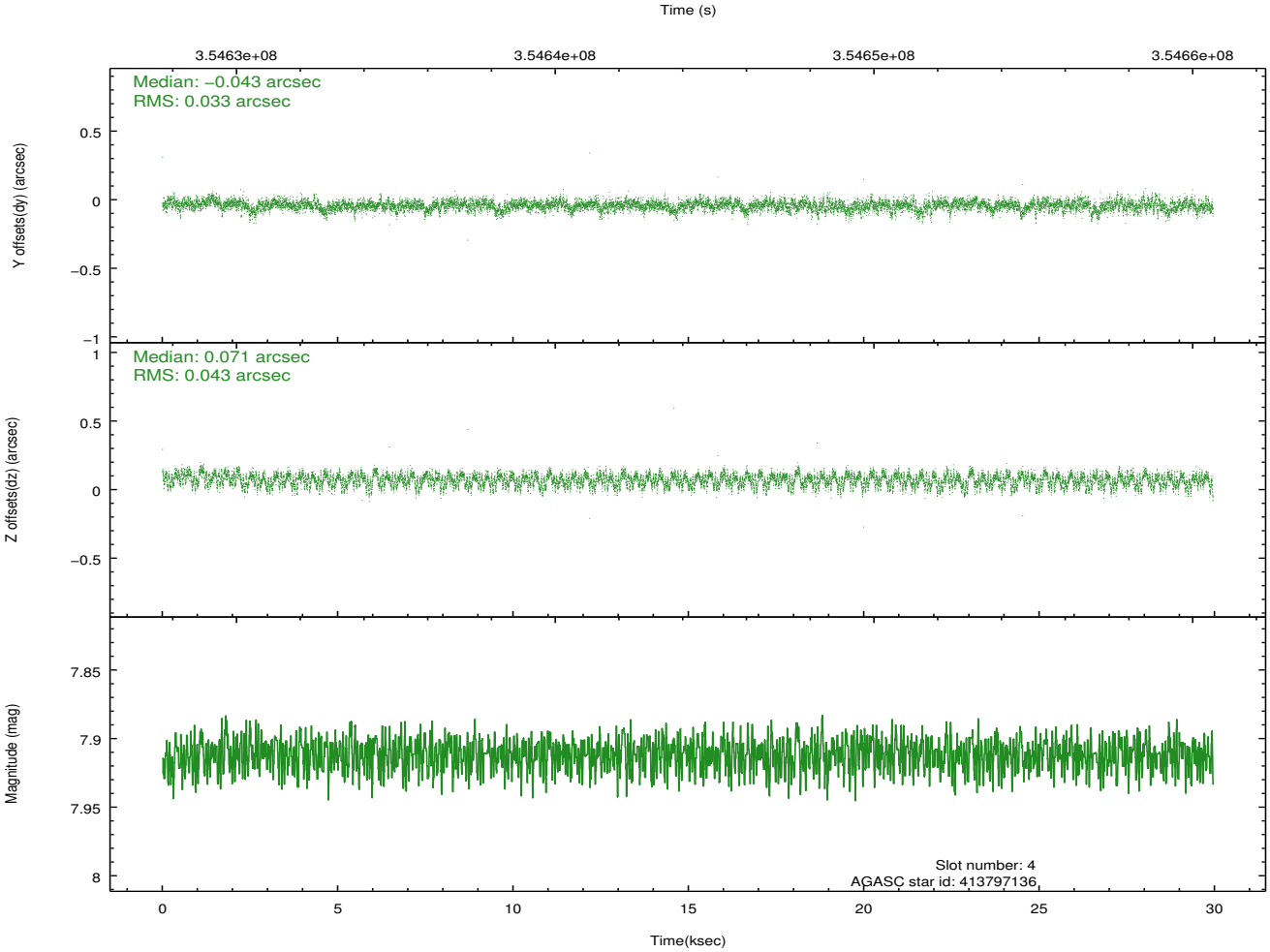




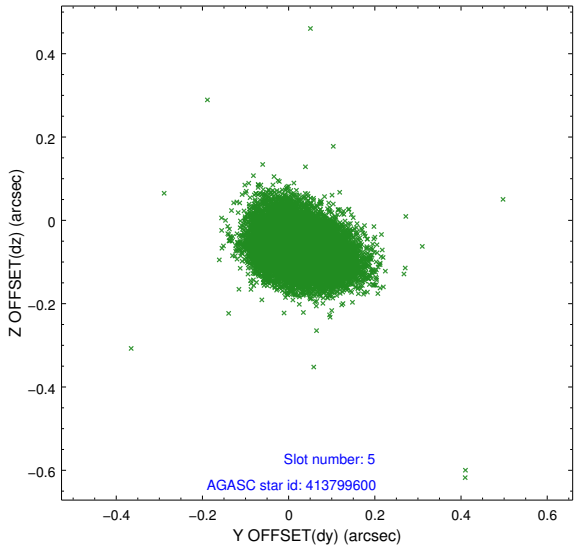
2.4.2 Slot 4

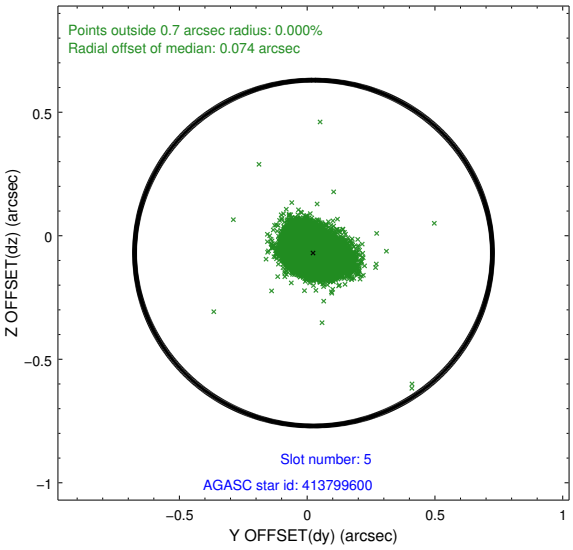

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 413797136

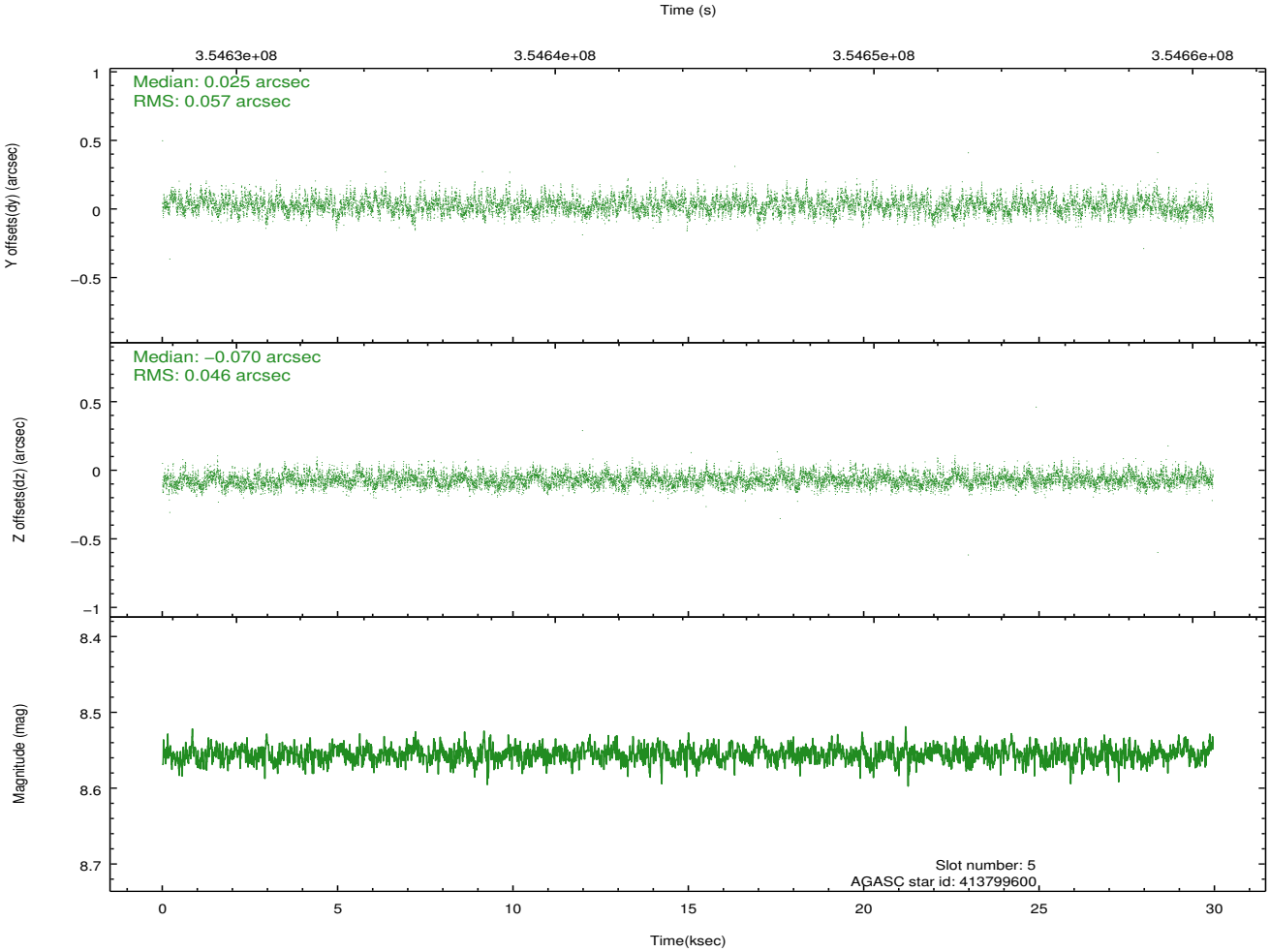

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.083 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 413797136


Time (s)
3.5463e+08
3.5464e+08
3.5465e+08
3.5466e+08
Median: –0.043 arcsec
RMS: 0.033 arcsec
Y offsets(dy) (arcsec)
Median: 0.071 arcsec
RMS: 0.043 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 413797136
Time(ksec)

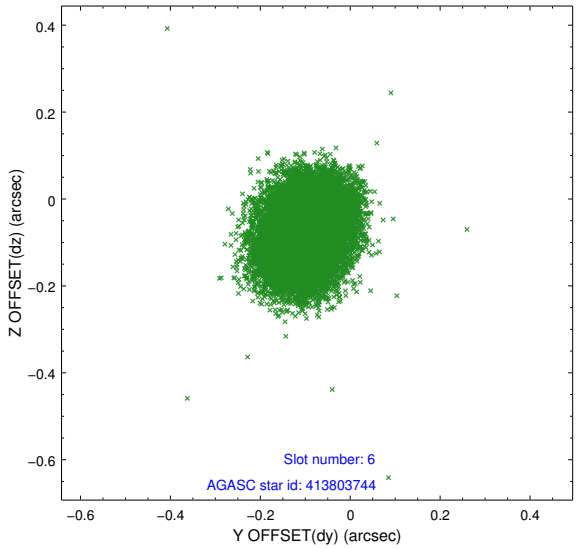
2.4.3 Slot 5

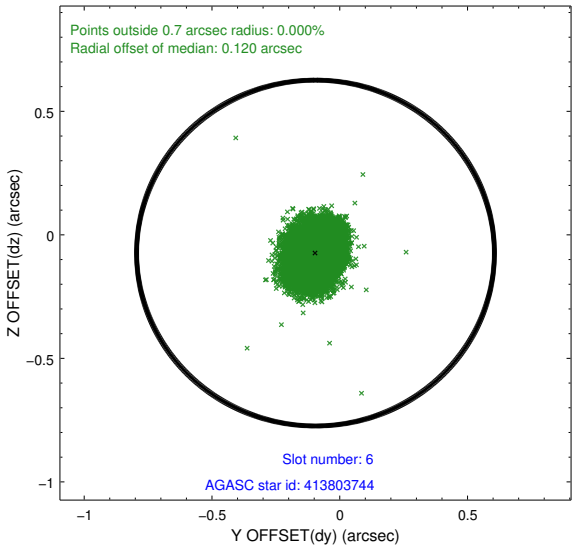

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 413799600

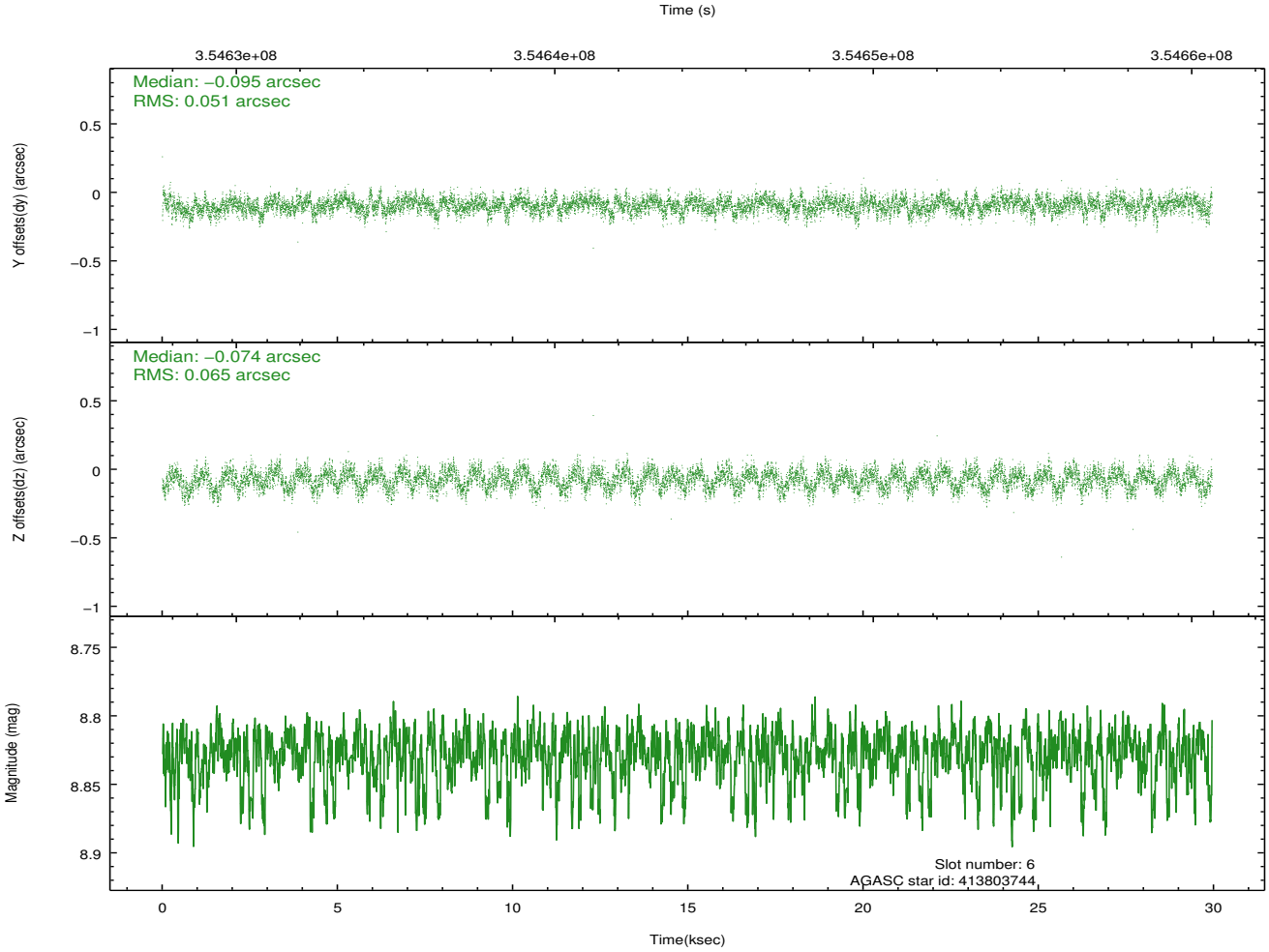

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.074 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 413799600


Time (s)
3.5463e+08
3.5464e+08
3.5465e+08
3.5466e+08
Median: 0.025 arcsec
RMS: 0.057 arcsec
Y offsets(dy) (arcsec)
Median: −0.070 arcsec
RMS: 0.046 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 413799600
Time(ksec)

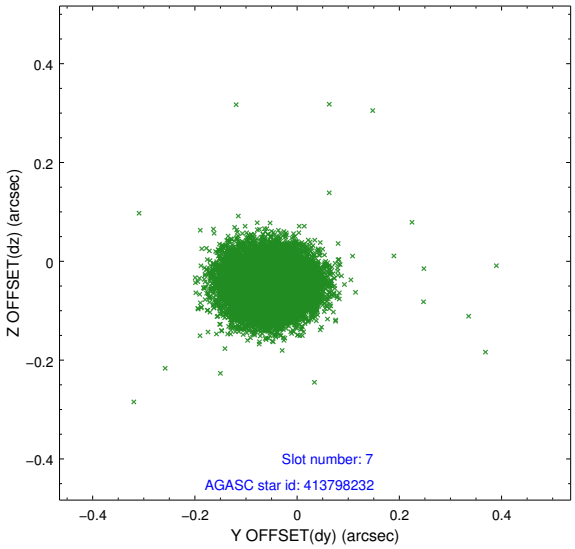
2.4.4 Slot 6

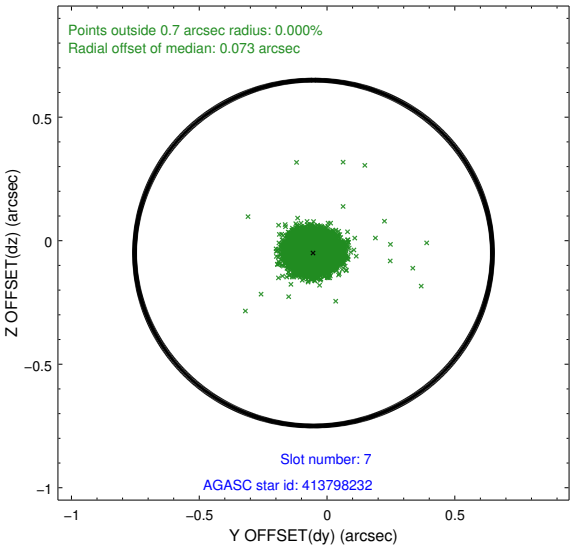

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 413803744

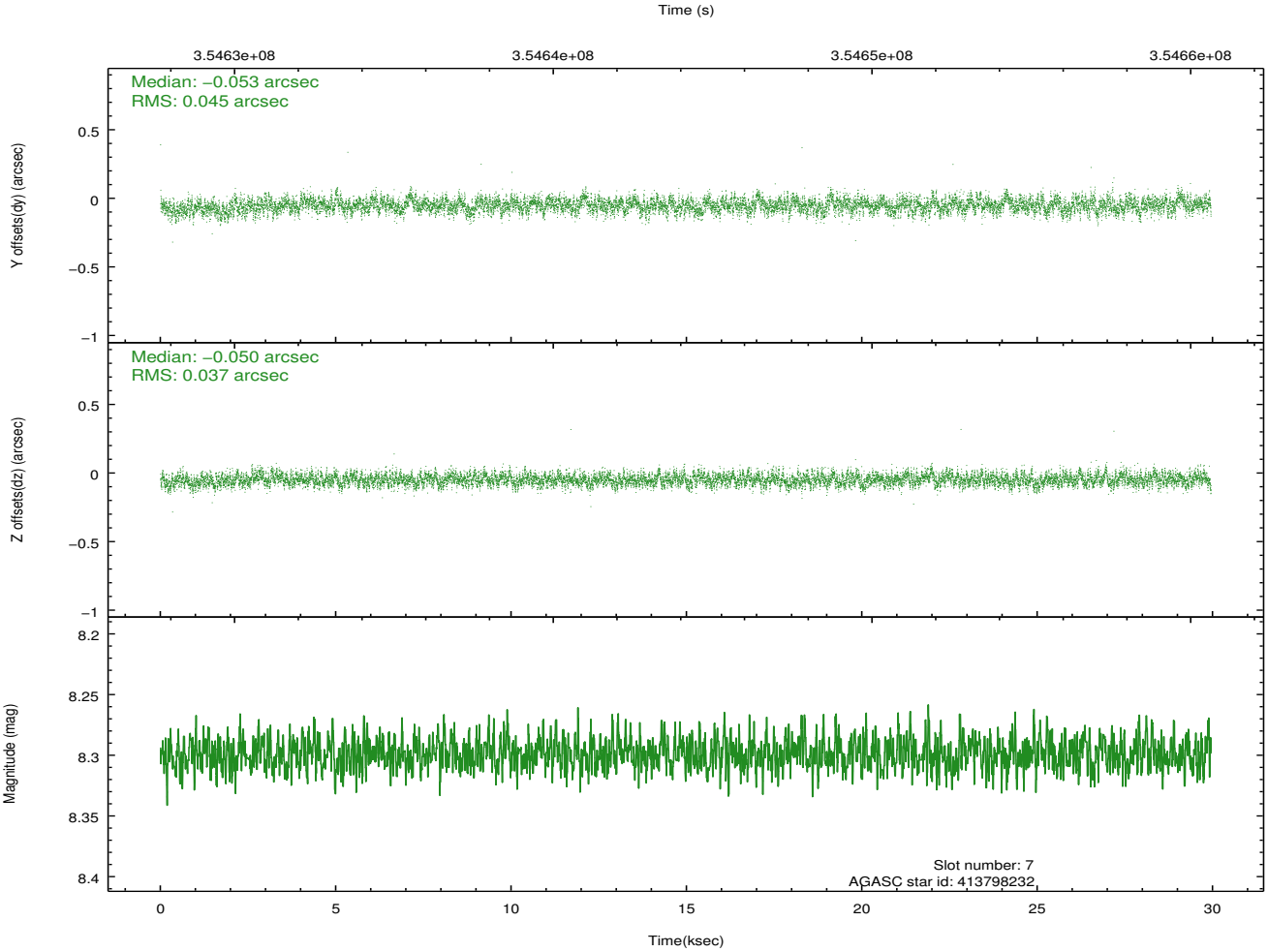

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.120 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 413803744


Time (s)
3.5463e+08
3.5464e+08
3.5465e+08
3.5466e+08
Median: −0.095 arcsec
RMS: 0.051 arcsec
Y offsets(dy) (arcsec)
Median: −0.074 arcsec
RMS: 0.065 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 413803744
Time(ksec)

2.4.5 Slot 7

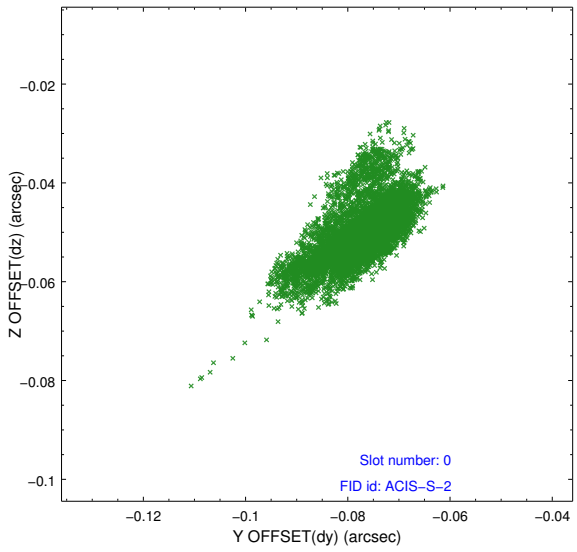

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 413798232

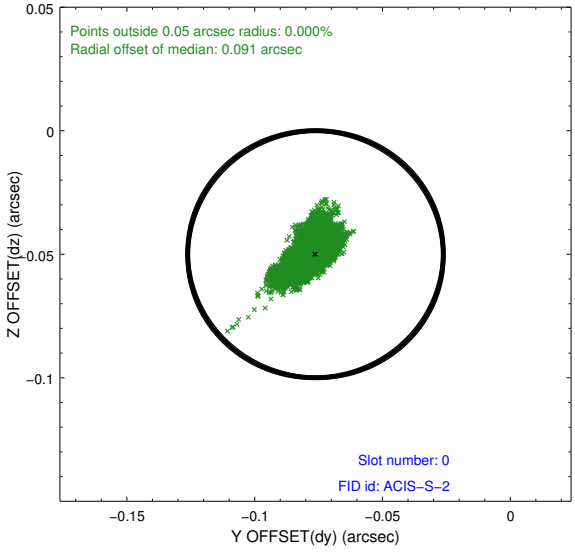

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.073 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 413798232

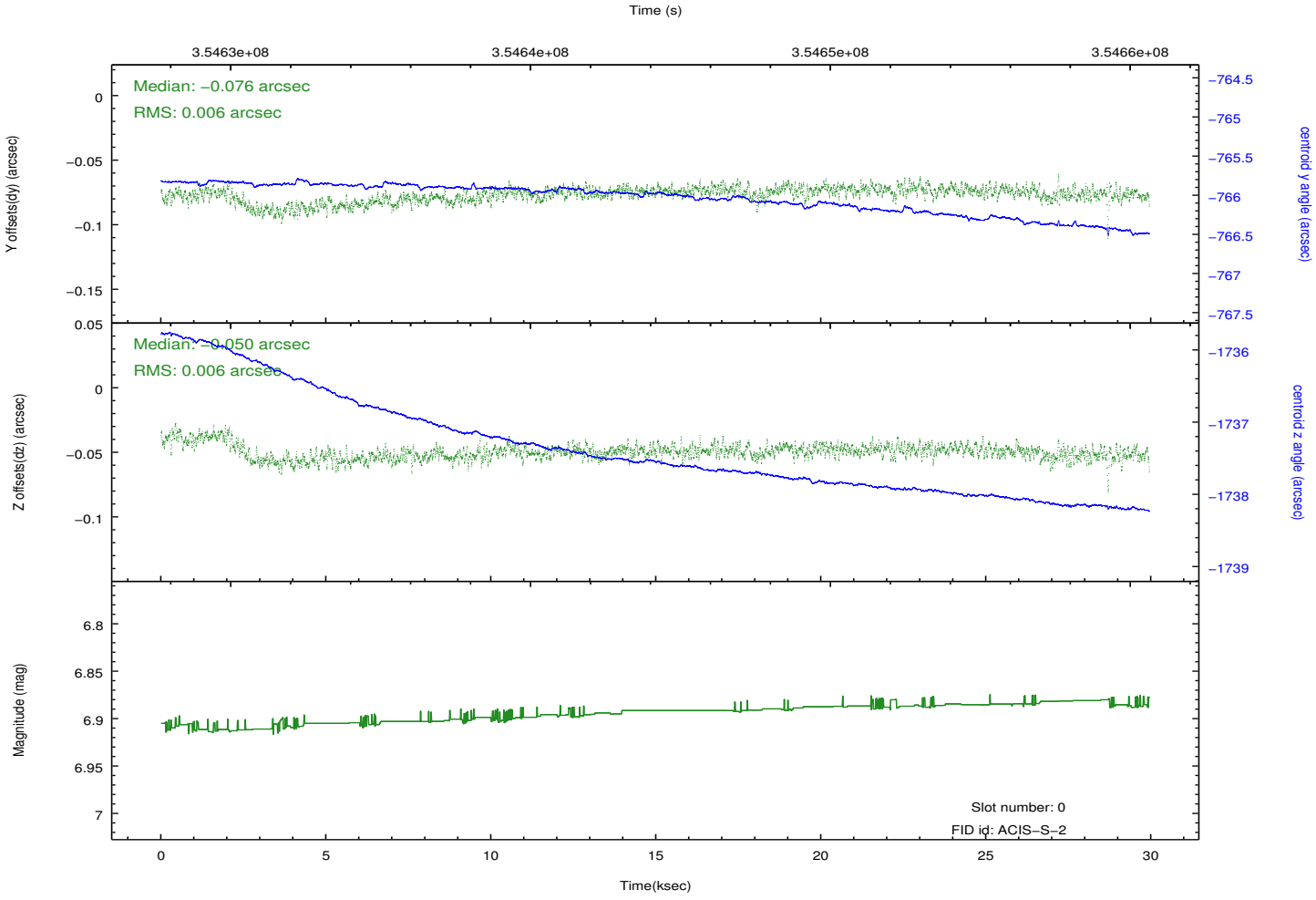

Time (s)
Median: −0.053 arcsec
RMS: 0.045 arcsec
Y offsets(dy) (arcsec)
Median: −0.050 arcsec
RMS: 0.037 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 413798232
Time(ksec)

2.5 FID Slots

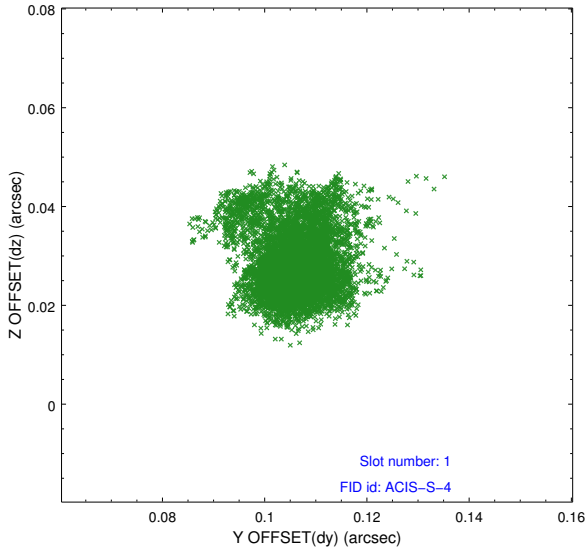
2.5.1 Slot 0

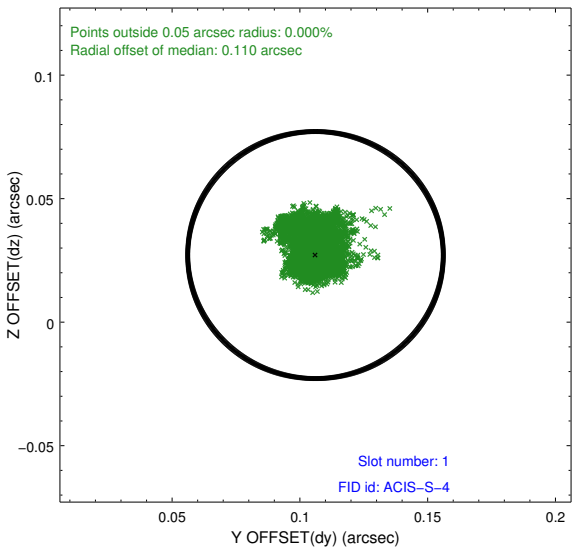


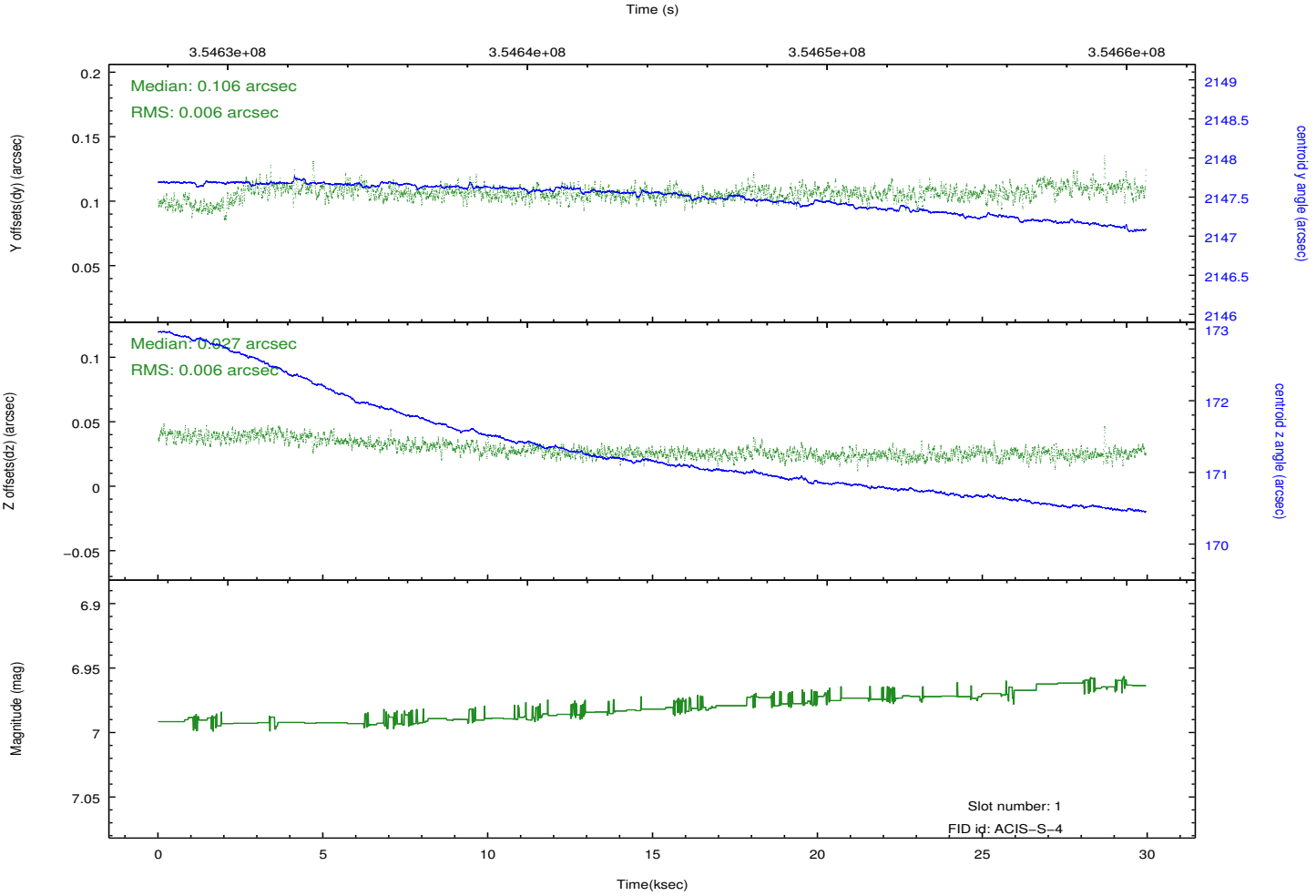




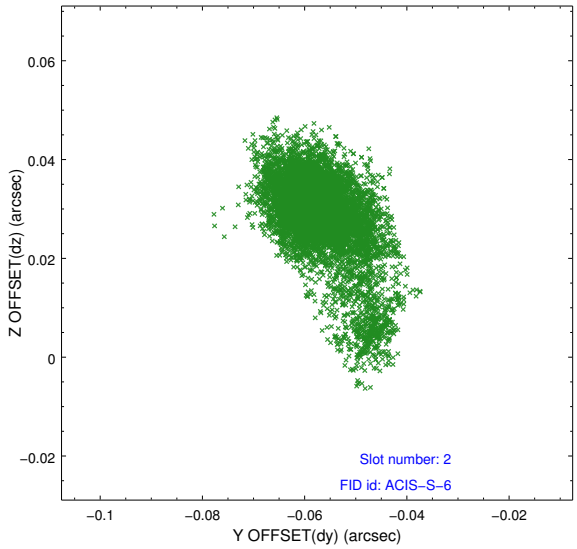
2.5.2 Slot 1

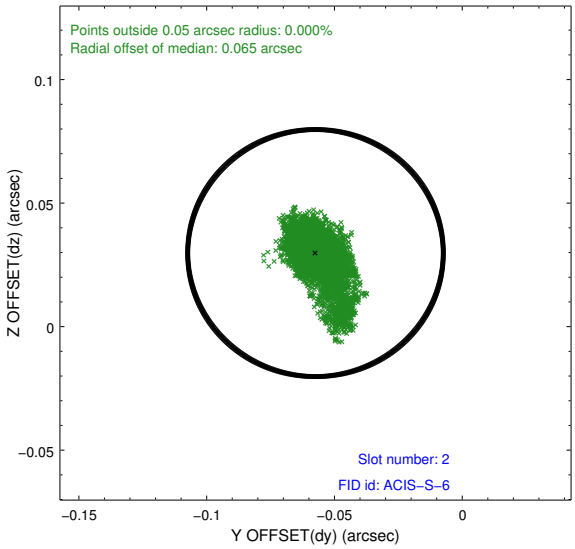

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4

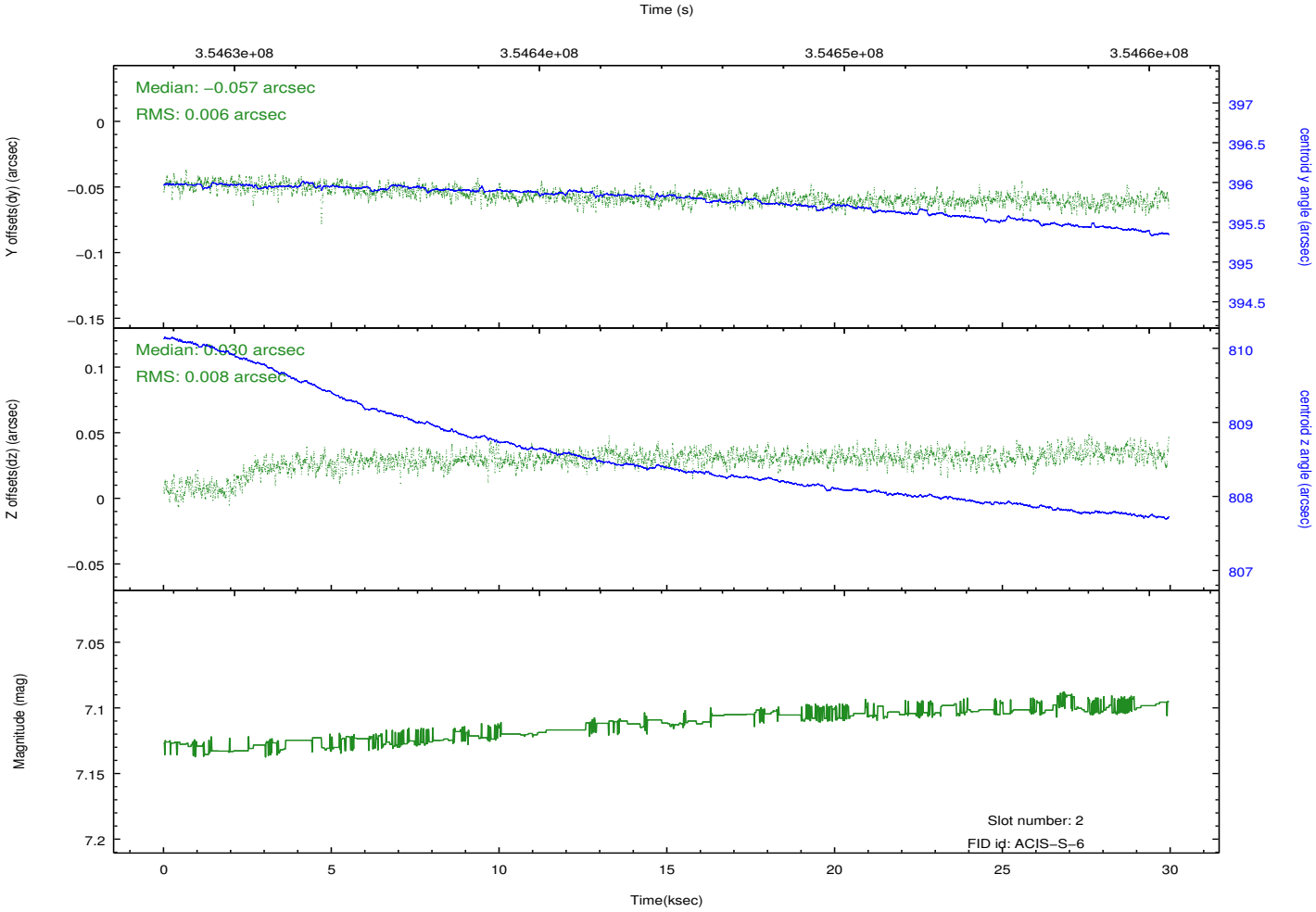

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.110 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4


Time (s)
Median: 0.106 arcsec
RMS: 0.006 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.027 arcsec
RMS: 0.006 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−6

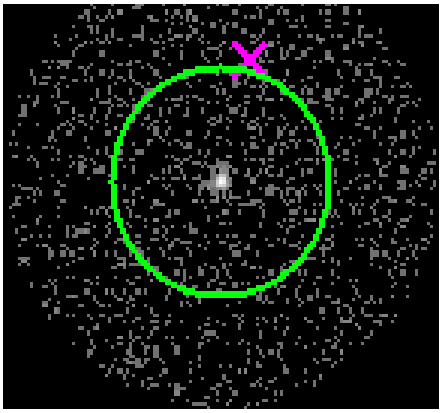

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.065 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−6


Time (s)
Median: −0.057 arcsec
RMS: 0.006 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.030 arcsec
RMS: 0.008 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 2
FID id: ACIS−S−6
Time(ksec)

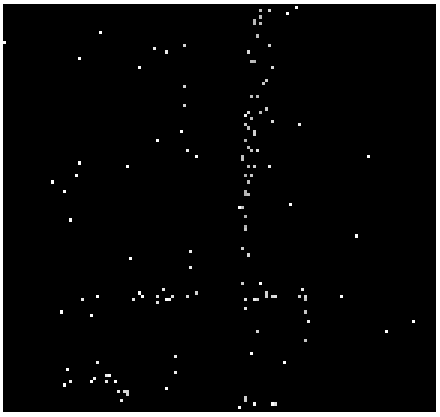
3 Gratings

3.1 HEG Arm

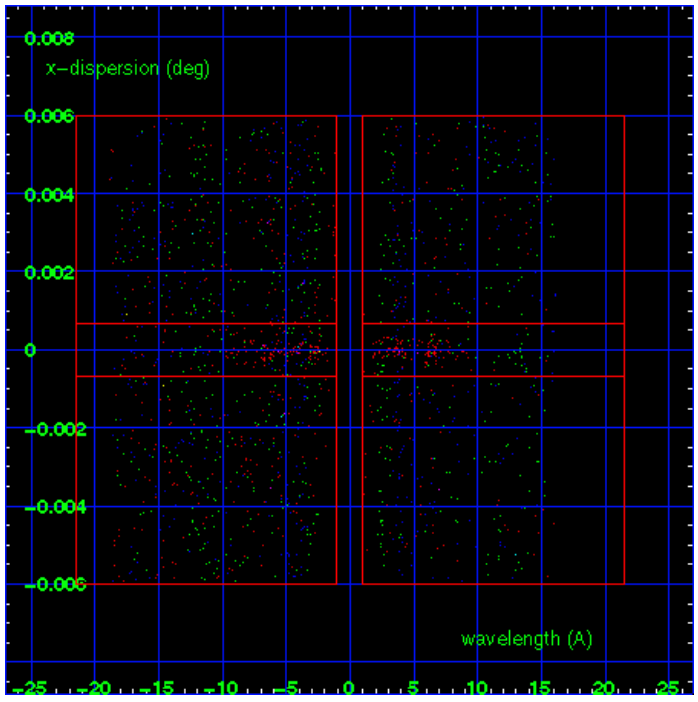
HEG Order Sort 123



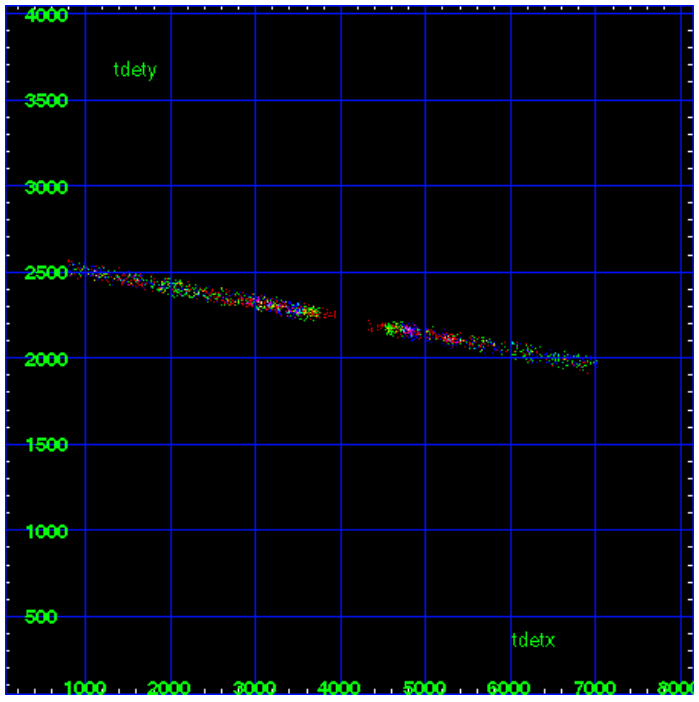
HEG Zero Order



HEG Order Sort ALL

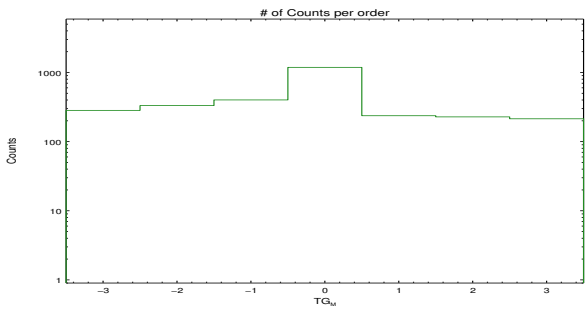


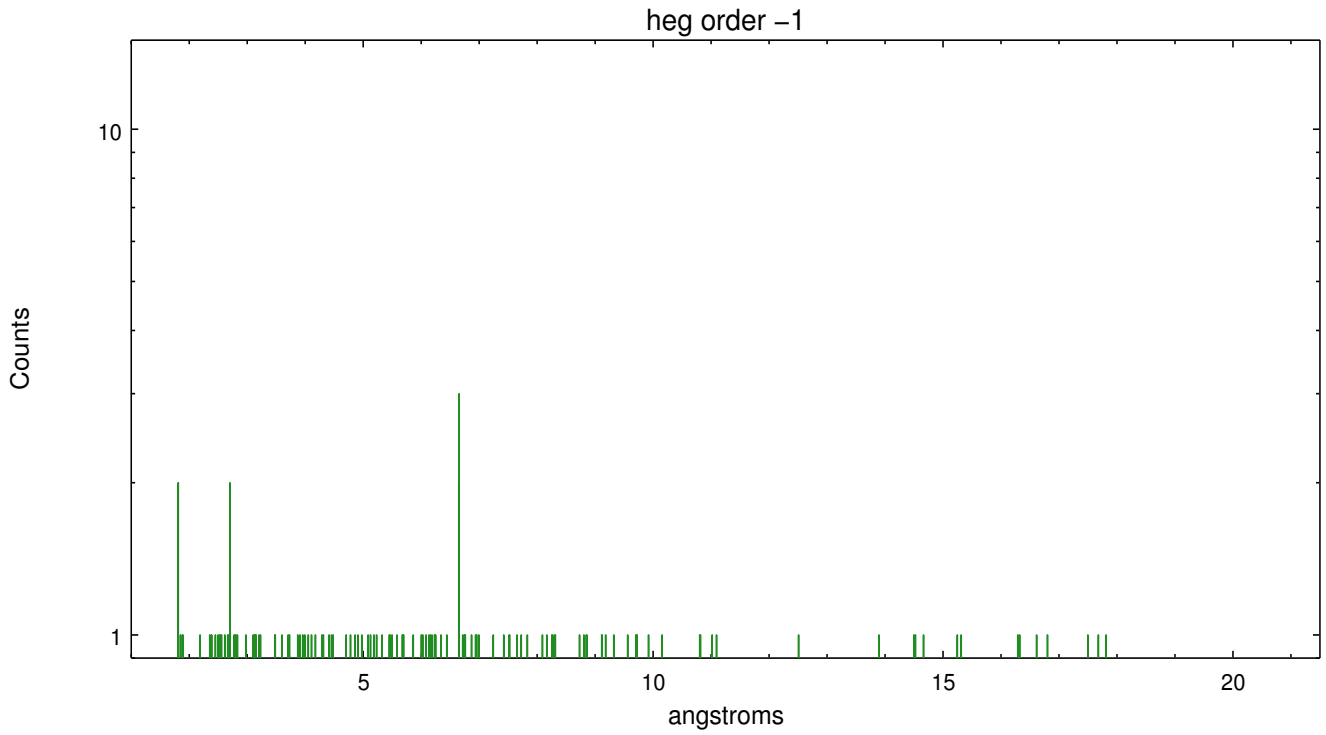
Spot Image HEG

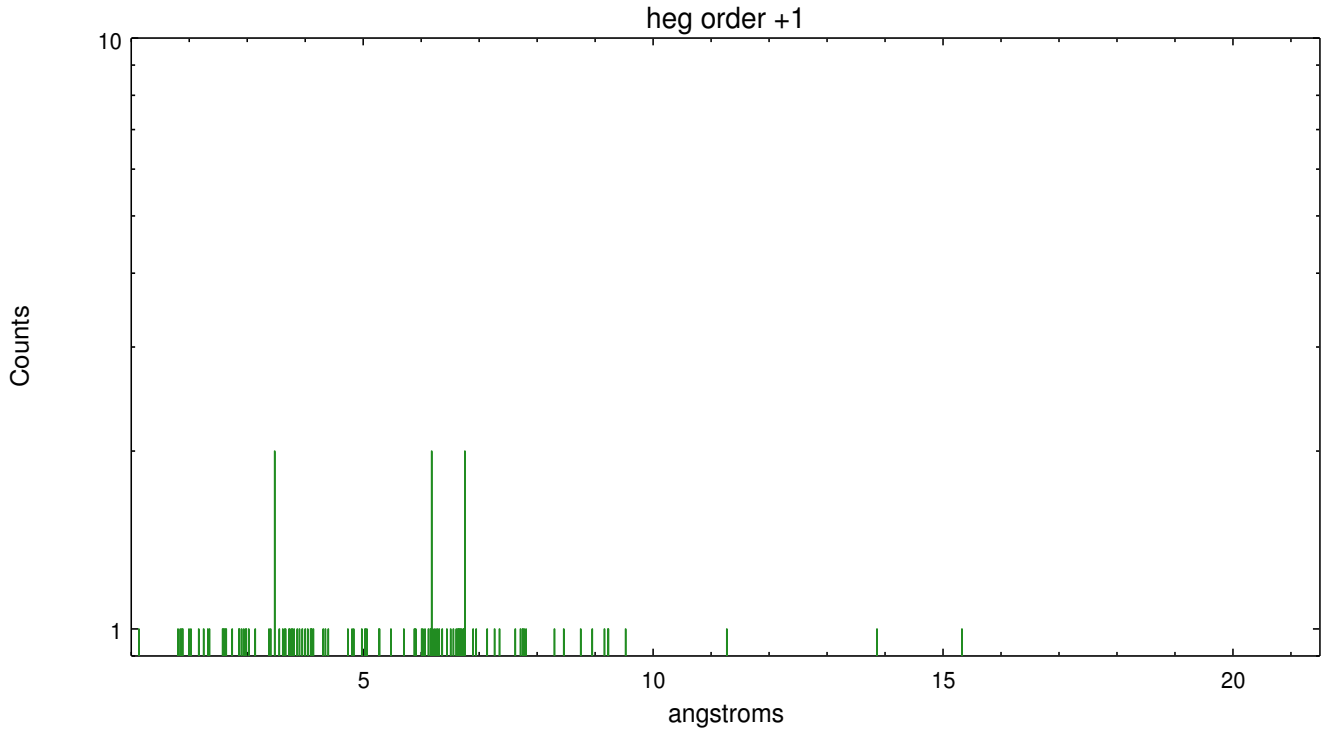


Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	283	332	401	1186	237	228	214

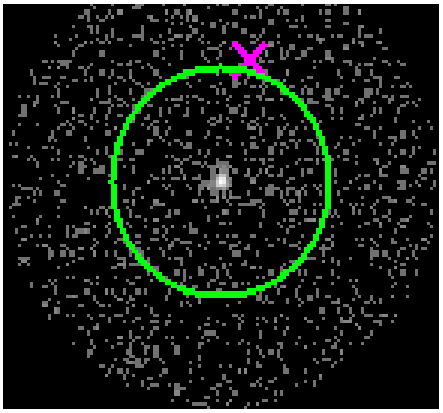



heg order −1
10
1
Counts
5
10
15
20
angstroms

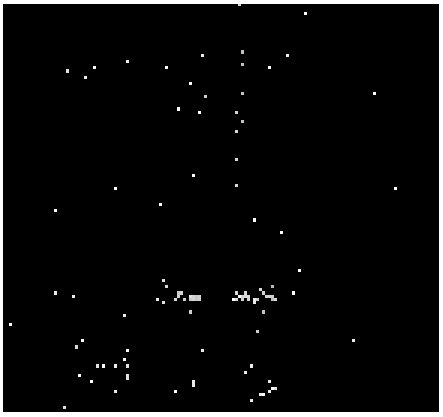

heg order +1
10
1
Counts
5
10
15
20
angstroms

3.2 MEG Arm

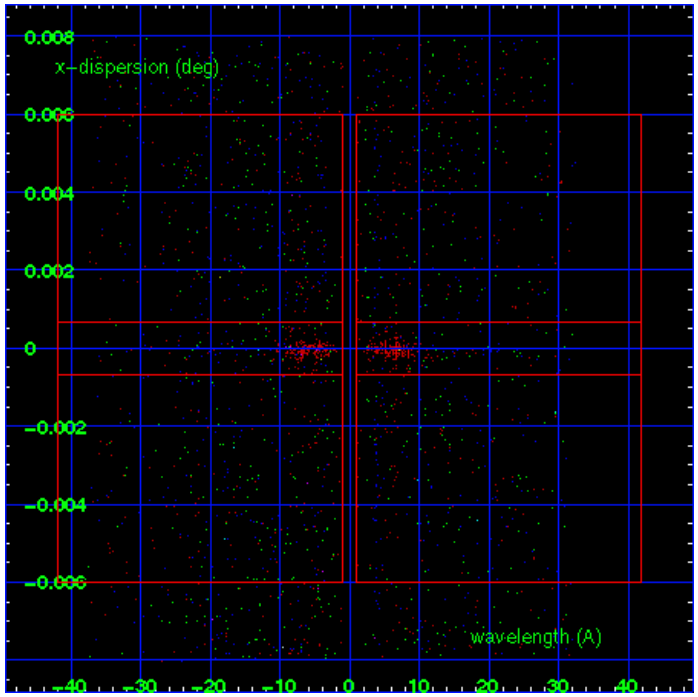
MEG Order Sort 123

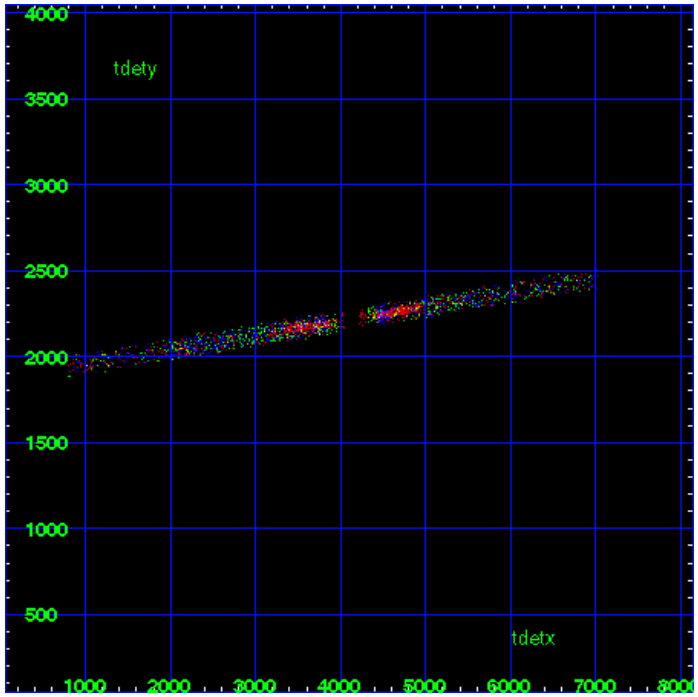


MEG Zero Order



MEG Order Sort ALL

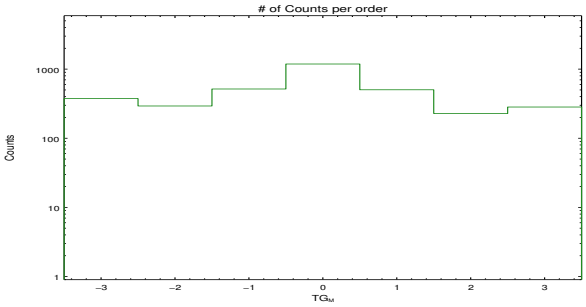


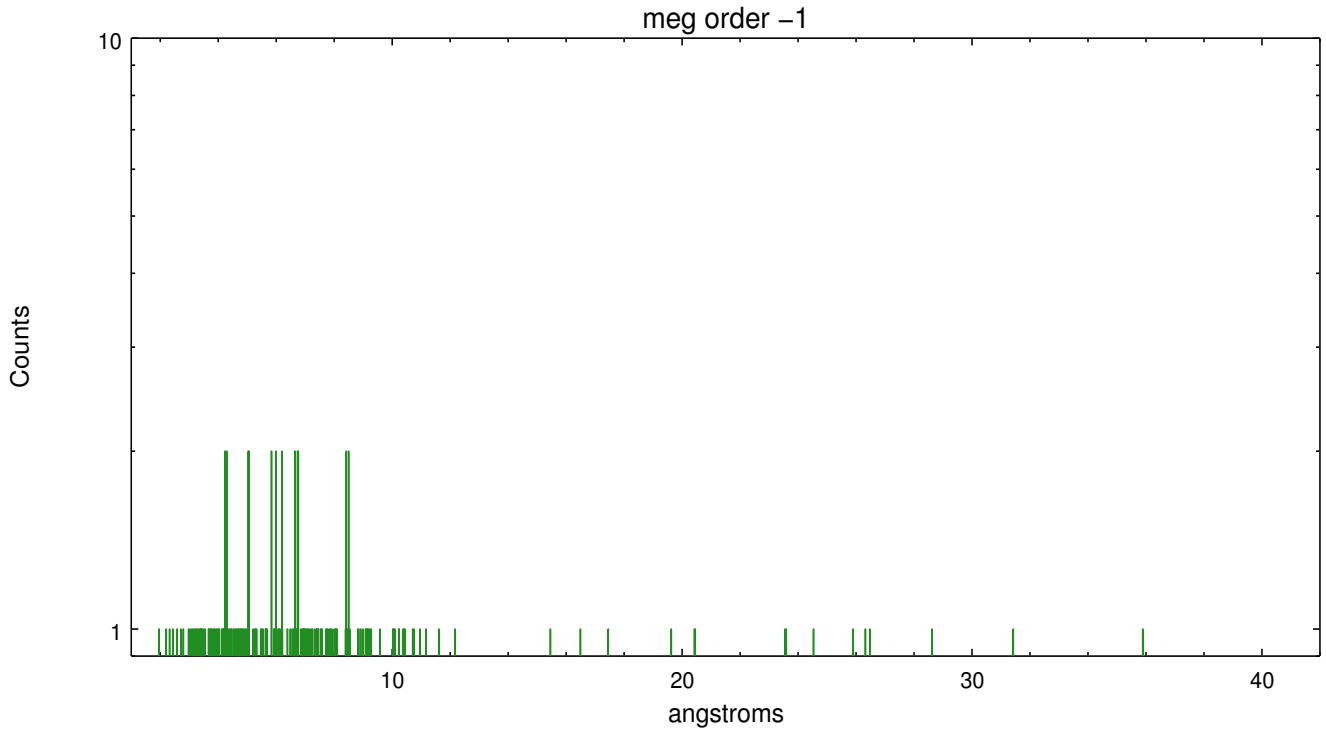


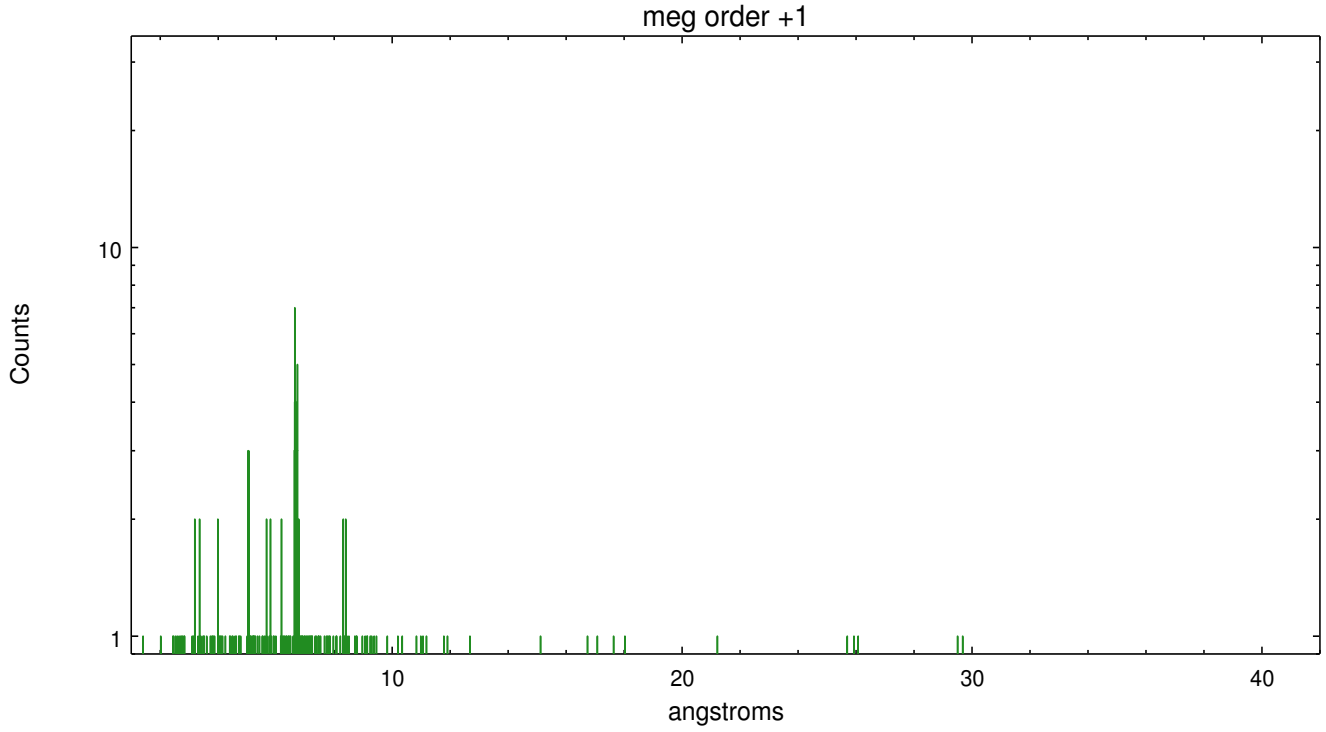
Spot Image MEG

Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	375	293	516	1186	503	228	283




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


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

A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2012.06.04
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	28.7455998

A.2 Comments

```
Roll constraint met.
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