V&V Reference Report
L2 ASCDS Version : 10.6

Observation 19452 - L2 Version 2
Chandra X-Ray Center

L2 Processing Date : Jul 7 2017

Contents

1 Front

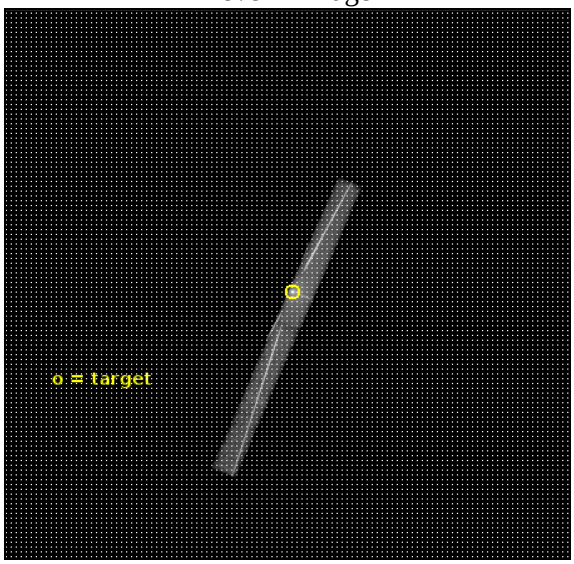
seq_num	901350	Sequence number
obs_id	19452	Observation id
title	THE ATOMIC TO DUST ABUNDANCE RATIO OF SILICON TOWARDS THE GALACTIC BULGE	Proposal title
observer	Norbert Schulz	Principal investigator
object	GX 354+0	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	262.990417	Observer's specified target RA [deg]
dec_targ	-33.834028	Observer's specified target Dec [deg]
ra_nom	262.99580164187	Nominal RA [deg]
dec_nom	-33.835015491848	Nominal Dec [deg]
roll_nom	292.65963602968	Nominal Roll [deg]
revision	2	Processing version of data
ontime	21892.5	Sum of GTIs [s]
livetime	20231.868253734	Livetime [s]
ontime6	21892.46590066	Sum of GTIs [s]
ontime7	21892.5	Sum of GTIs [s]
l2events	236695	Number of level 2 events

2 OBI

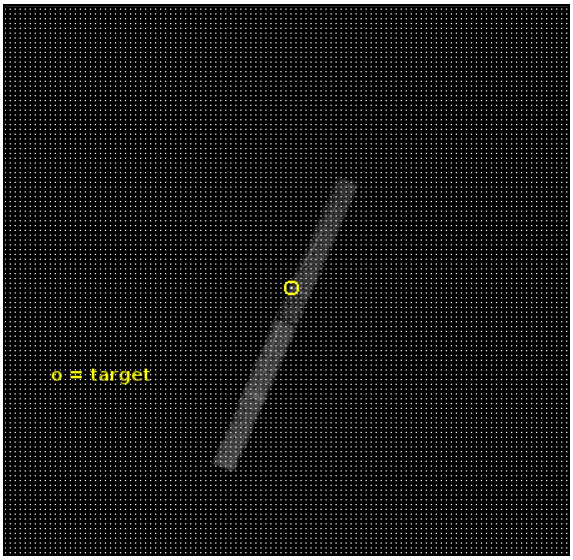
2.1 OBI

2.1.1 Images

Level 1 Image

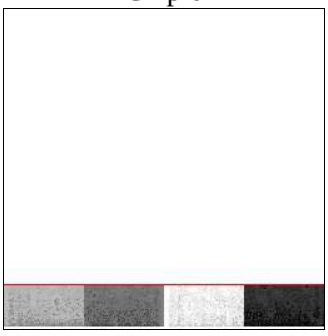


Level 1 Bad Events

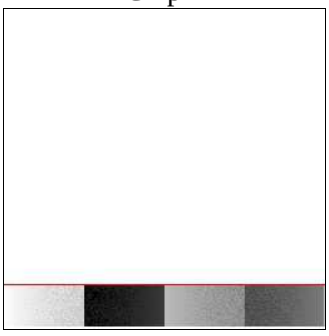


2.1.2 Bias

Chip 6



Chip 7



2.1.3 Parameters

obi_num	0	Obi number
ascdsver	10.6	Processing system revision
caldbver	4.7.5	
date	2017-07-05T20:12:20	Date and time of file creation
revision	1	Processing version of data

sched_exp_time	21800.000000	[s] Scheduled observation exposure time
ontime	21892.5	Sum of GTIs [s]
ontime6	21892.46590066	Sum of GTIs [s]
ontime7	21892.5	Sum of GTIs [s]
l1events	292119	Number of level 1 events
tgmethod	MANUAL	Method used to create src1a file
zo_pos	(4129.50, 4104.69)	src1a sky pixel position
zo_pos_tgd	(4129.47, 4104.69)	src1a sky pixel position via tgdetect

2.1.4 Events

	ccd 6	**ccd 7**
level 1 events	110382	181737
rejected events	26507	22662
rejected %	24%	12%

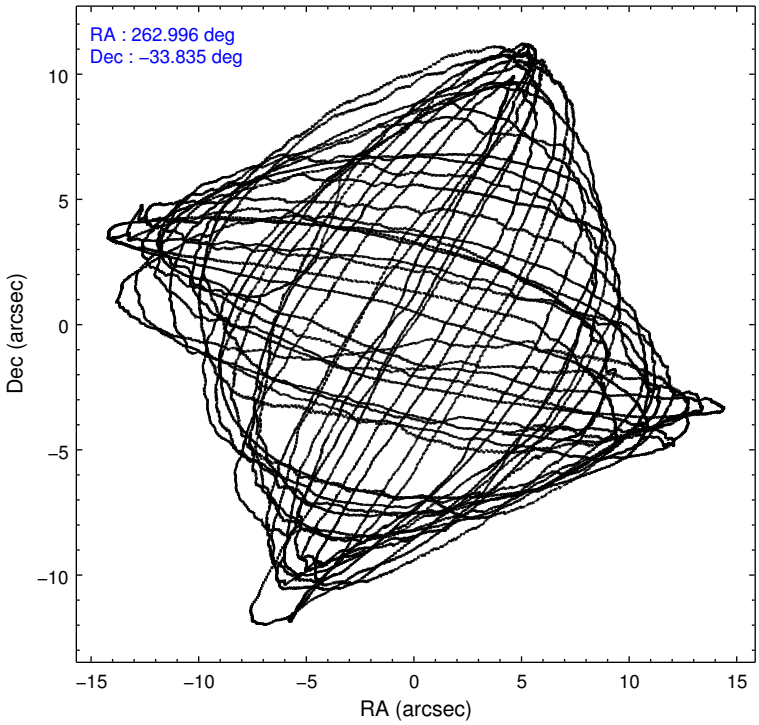
	ccd 6	**ccd 7**
grade 0 events	52864	26924
	47%	14%
grade 1 events	183	689
	0%	0%
grade 2 events	12627	37100
	11%	20%
grade 3 events	4852	16935
	4%	9%
grade 4 events	4803	16697
	4%	9%
grade 5 events	1132	6014
	1%	3%
grade 6 events	8734	61430
	7%	33%
grade 7 events	25187	15948
	22%	8%

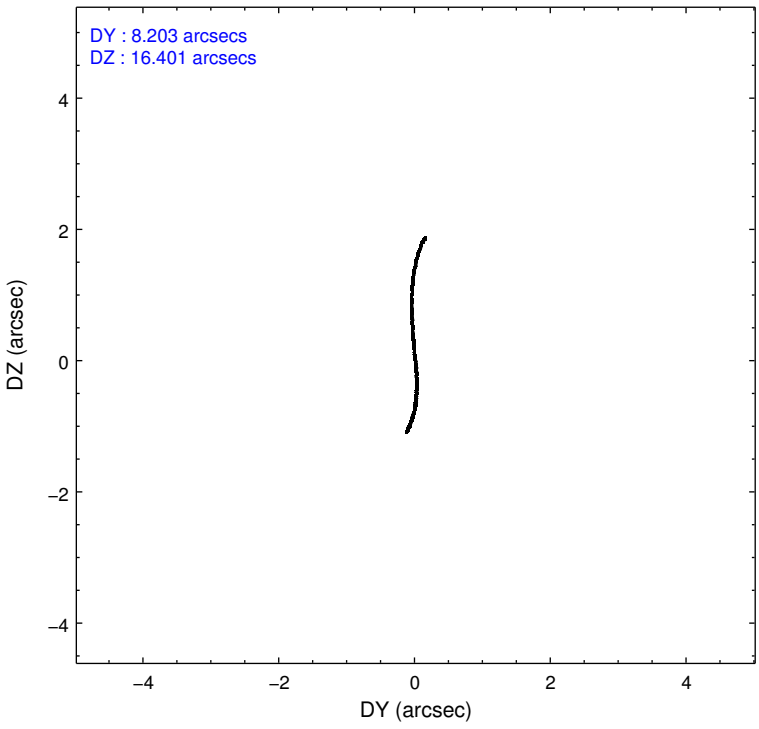
2.2 Compared Parameters

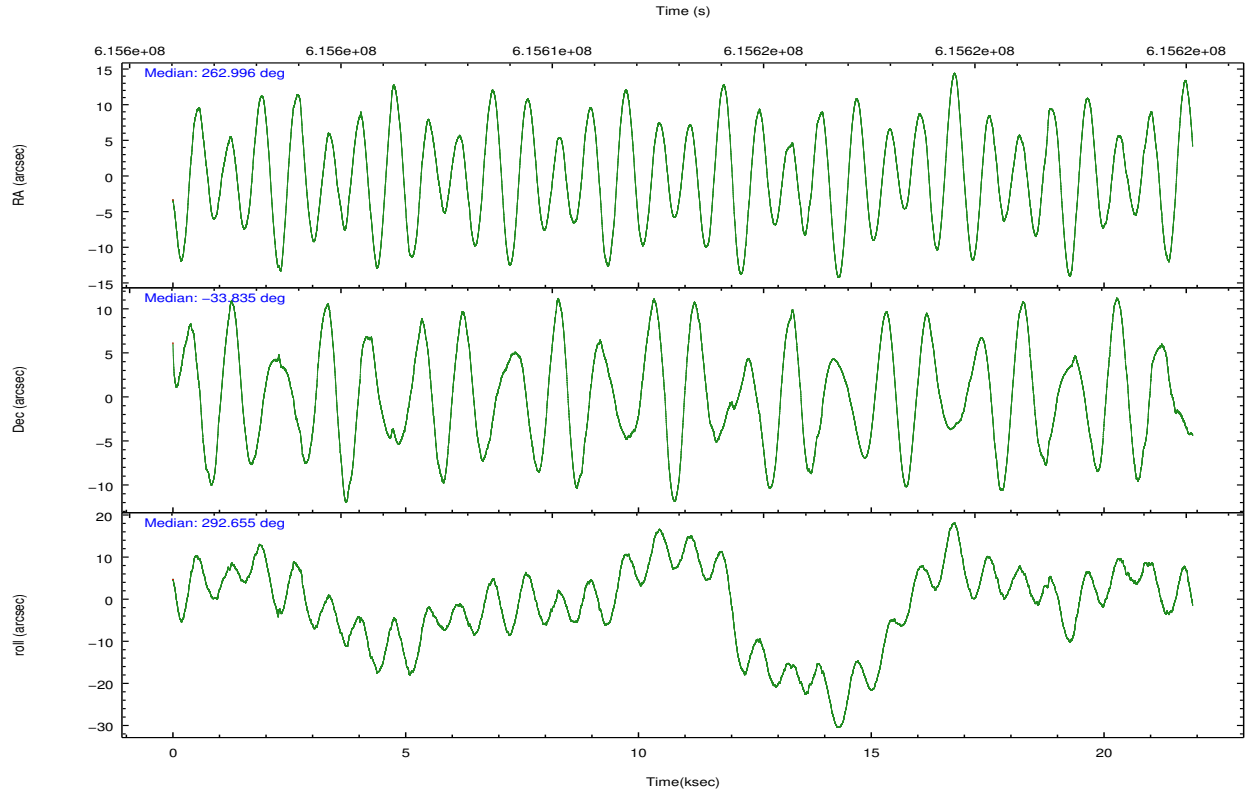
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-67	ACIS-67
Grating	HETG	HETG
Data mode	FAINT	FAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	262.969265	262.9958016418686
[deg] Pointing Dec	-33.818671	-33.83501549184849
[deg] Pointing Roll	292.488235	292.659636029684
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-178.032523	-178.0336378728605
[mm] SIM translation stage offset	-12.1	-12.09888471014733
[s] Observation start time (MET)	615602232.184000	615600889.054
Observation start date	2017-07-05T00:36:03	2017-07-05T00:14:49
[s] Observation end time (MET)	615624032.184000	615624675.71788
Observation end date	2017-07-05T06:39:23	2017-07-05T06:51:15
Read mode	TIMED	TIMED

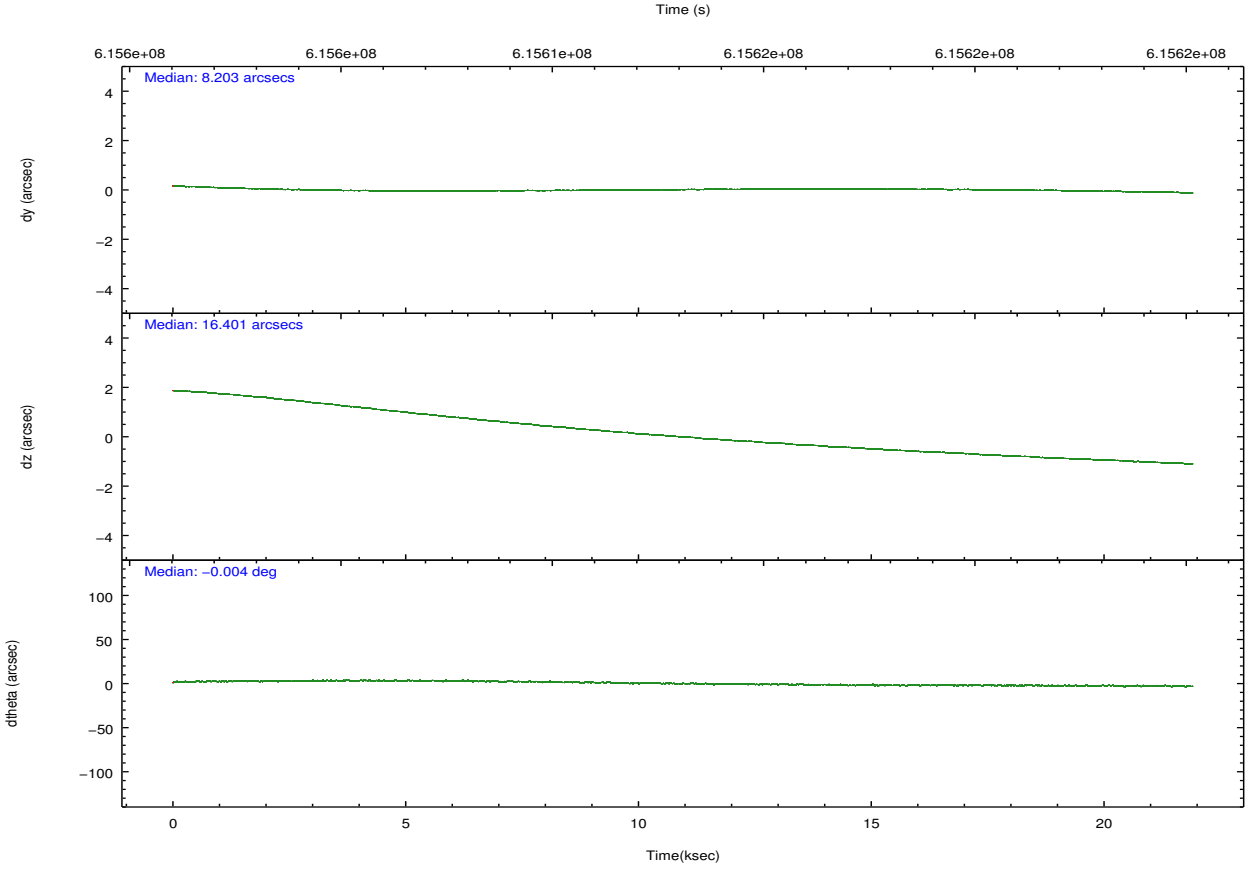
Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	CUSTOM	CUSTOM
Subarray start row	10	10
Subarray row count	134	134
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	0.5

2.3 Aspect


RA : 262.996 deg
Dec : −33.835 deg
Dec (arcsec)
RA (arcsec)
10
5
0
−5
−10
−15
−10
−5
0
5
10
15


DY : 8.203 arcsecs
DZ : 16.401 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−4
−2
0
2
4


Time (s)
6.156e+08
6.156e+08
6.1561e+08
6.1562e+08
6.1562e+08
6.1562e+08
RA (arcsec)
Median: 262.996 deg
Dec (arcsec)
Median: −33.835 deg
roll (arcsec)
Median: 292.655 deg
Time(ksec)

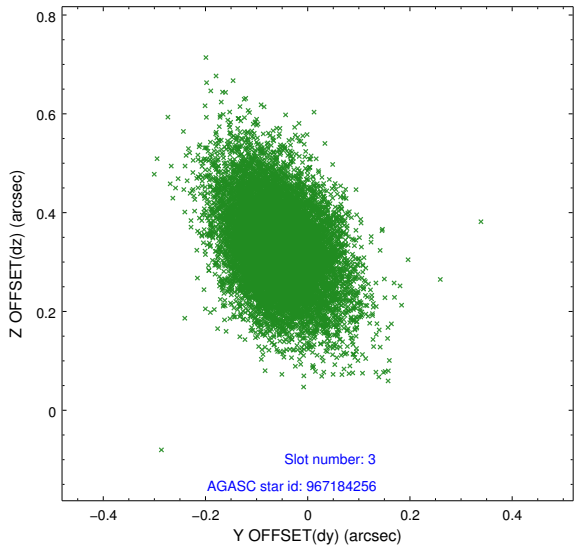

Time (s)
6.156e+08
6.156e+08
6.1561e+08
6.1562e+08
6.1562e+08
6.1562e+08
dy (arcsec)
Median: 8.203 arcsecs
dz (arcsec)
Median: 16.401 arcsecs
dtheta (arcsec)
Median: −0.004 deg
Time(ksec)

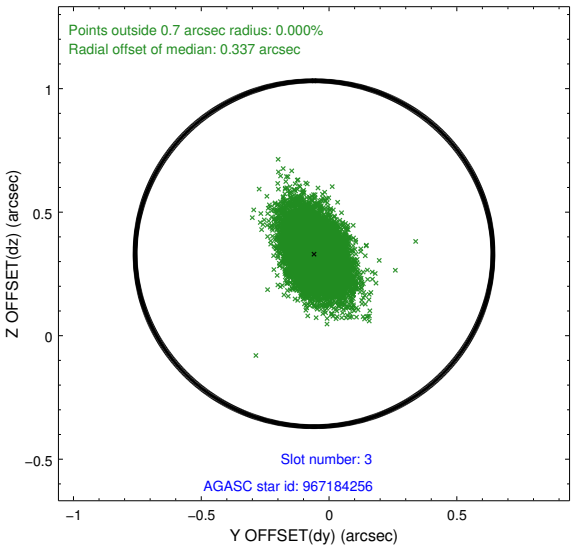
Slot Statistics

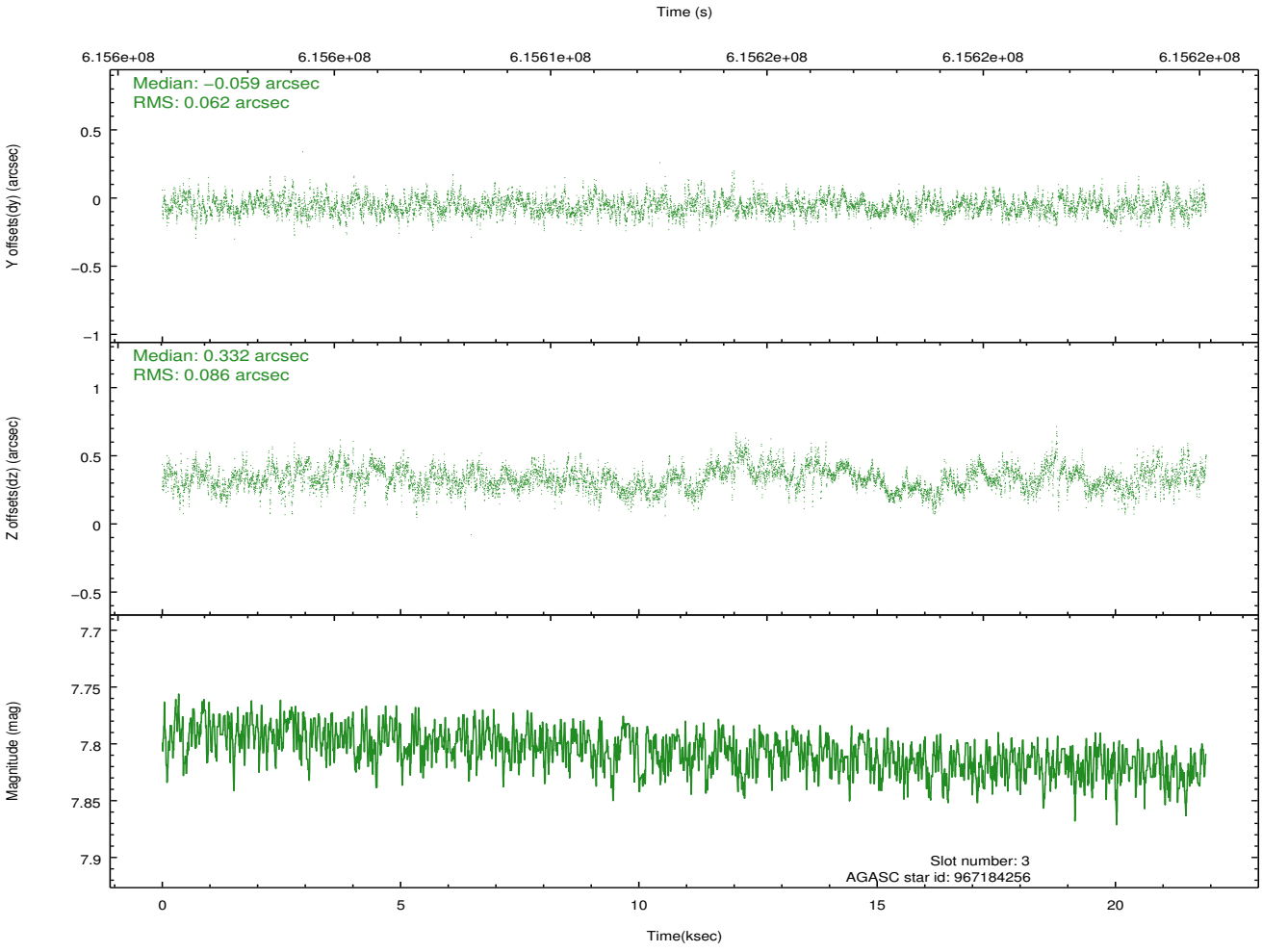
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-S-2	6.92	5343	-0.169	-0.450	0.027	0.041	0.000000	0.000000	-760.24	-1987.47
1	FID		ACIS-S-4	7.00	5343	0.333	0.203	0.017	0.025	0.000000	0.000000	2153.45	-78.56
2	FID		ACIS-S-5	7.08	5343	-0.197	0.258	0.020	0.028	0.000000	0.000000	-1812.92	-84.67
3	GUIDE	used	967184256	7.81	10684	-0.059	0.332	0.109	0.189	262.701584	-33.609898	-999.95	-454.18
4	GUIDE	used	967705352	7.69	10683	0.094	-0.101	0.115	0.201	262.627740	-34.539041	2011.04	-1928.36
5	GUIDE	used	967706296	8.27	10680	0.071	0.050	0.109	0.190	262.582774	-34.480498	1765.70	-1971.87
6	GUIDE	used	967185024	8.62	10680	0.373	-0.058	0.136	0.226	262.820462	-33.346243	-1741.26	236.56
7	GUIDE	used	967837824	7.16	10681	-0.487	-0.216	0.116	0.219	263.710184	-34.276828	2374.11	1402.67

2.4 Star Slots

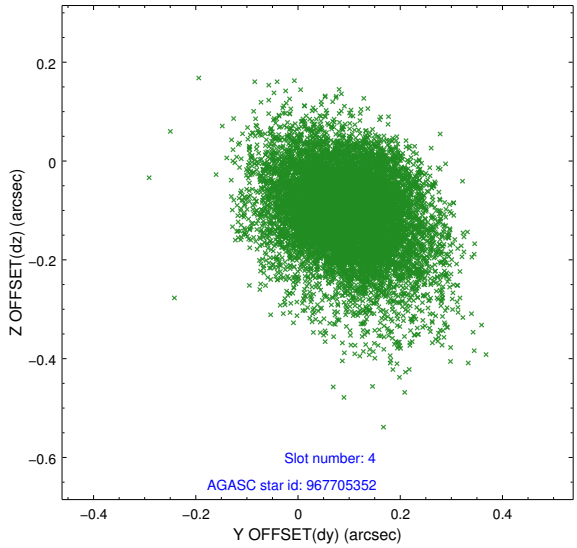
2.4.1 Slot 3

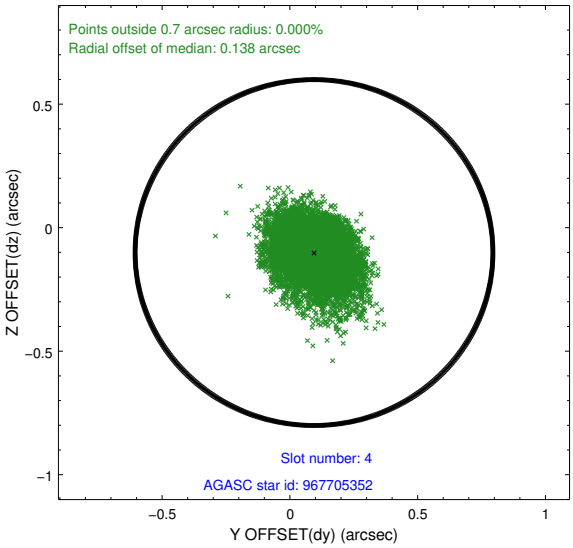


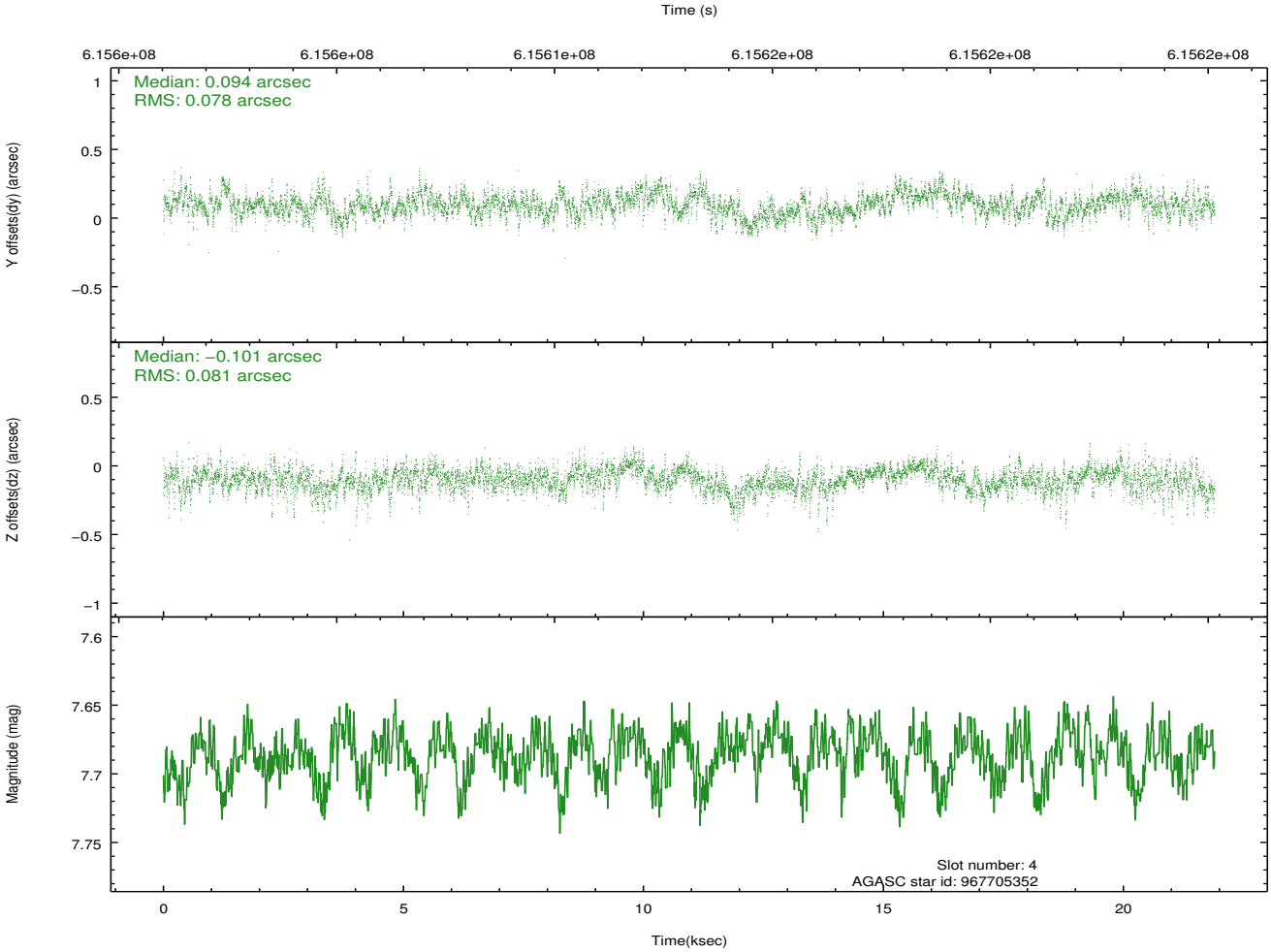




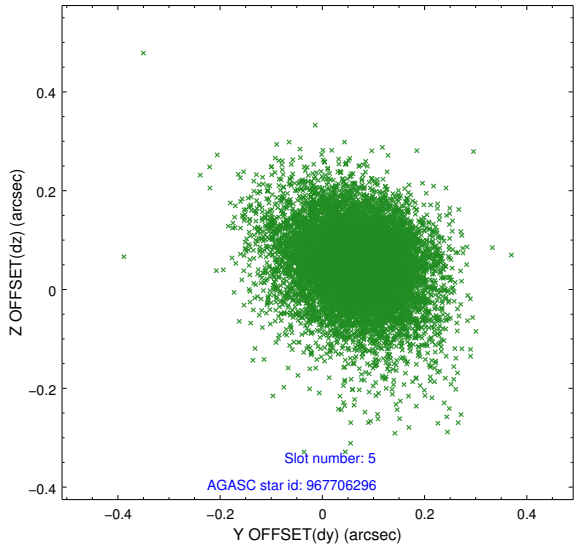
2.4.2 Slot 4

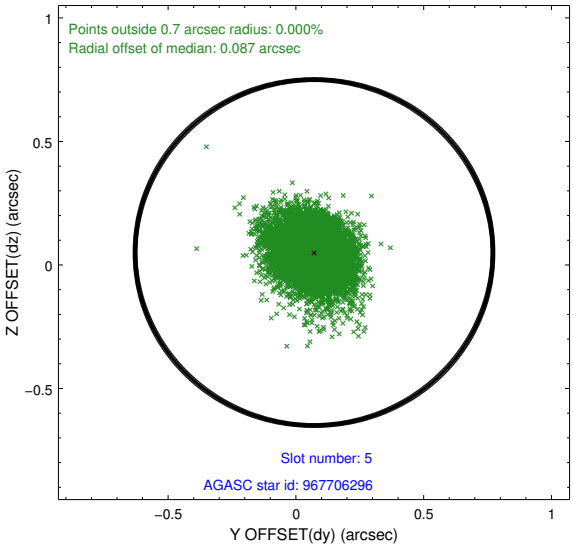

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 967705352

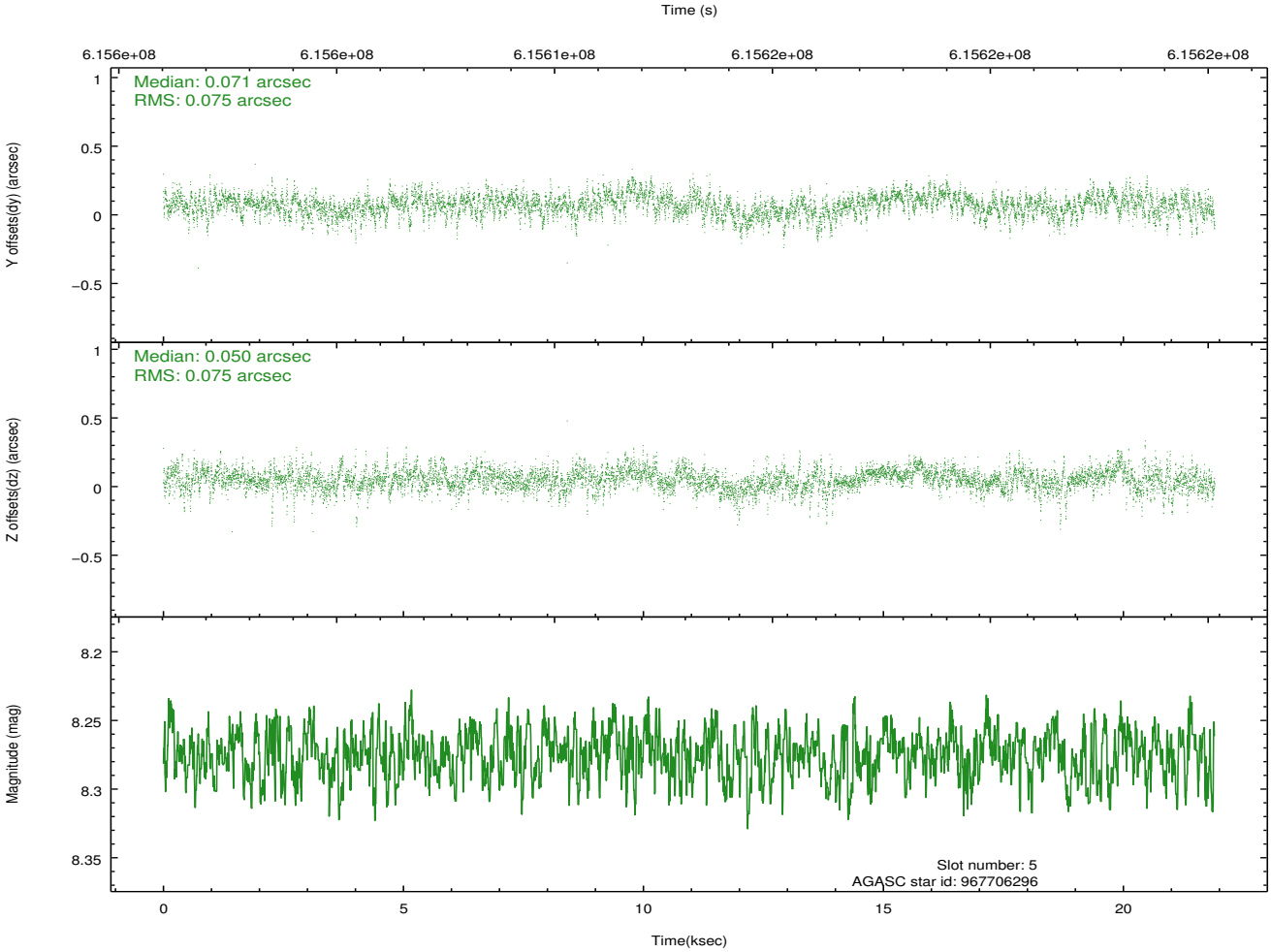

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.138 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 967705352


Time (s)
Median: 0.094 arcsec
RMS: 0.078 arcsec
Y offsets(dy) (arcsec)
Median: −0.101 arcsec
RMS: 0.081 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 967705352
Time(ksec)

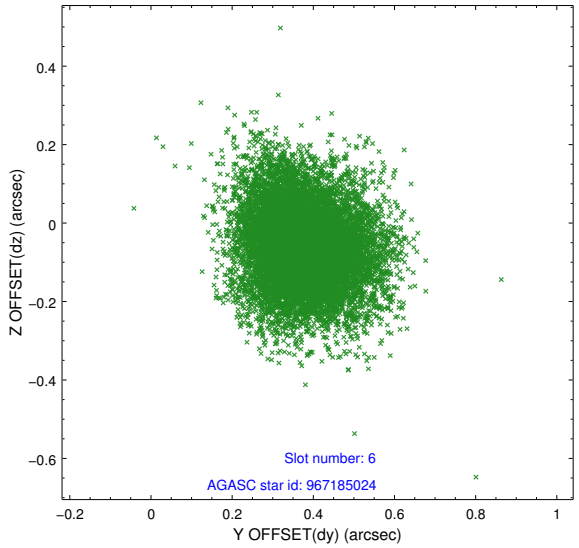
2.4.3 Slot 5

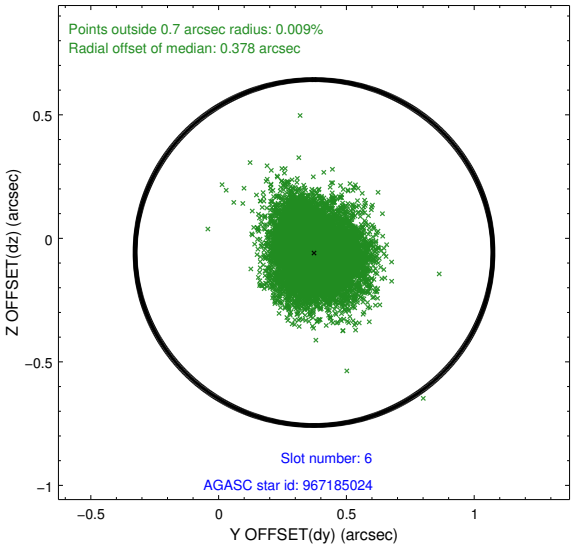

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 967706296

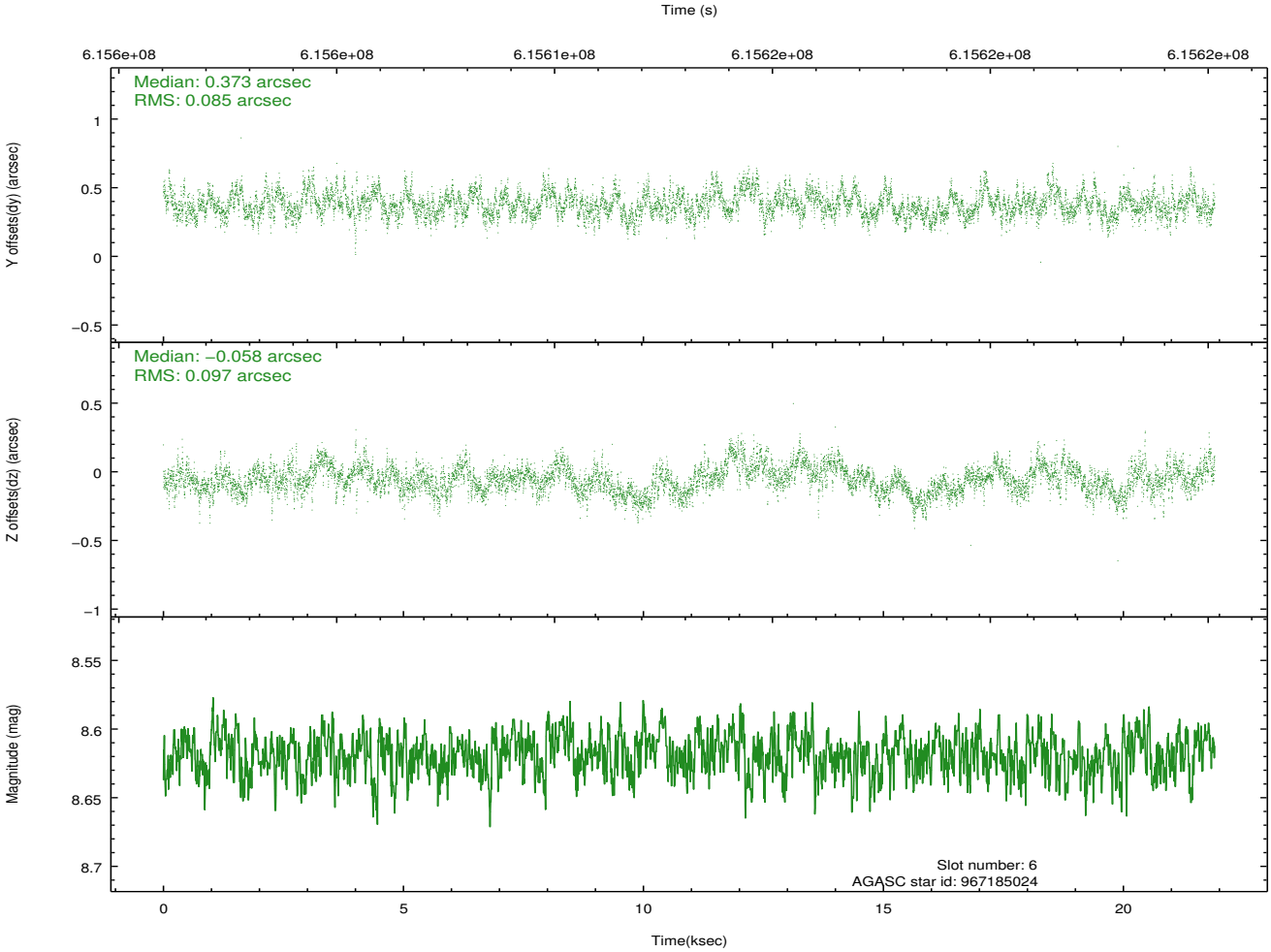

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.087 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 967706296


Time (s)
Median: 0.071 arcsec
RMS: 0.075 arcsec
Y offsets(dy) (arcsec)
Median: 0.050 arcsec
RMS: 0.075 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 967706296
Time(ksec)

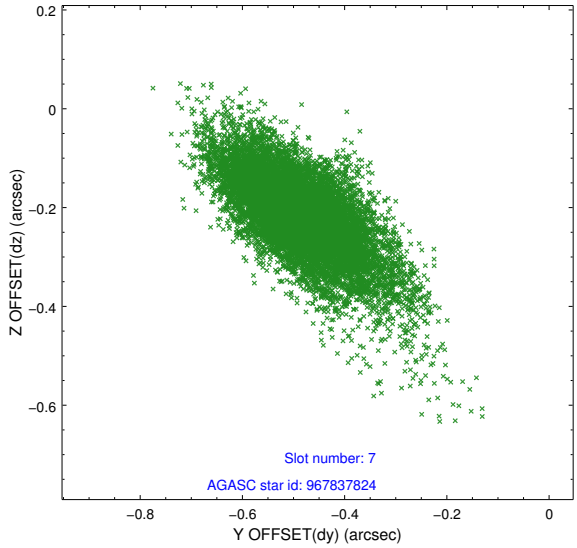
2.4.4 Slot 6

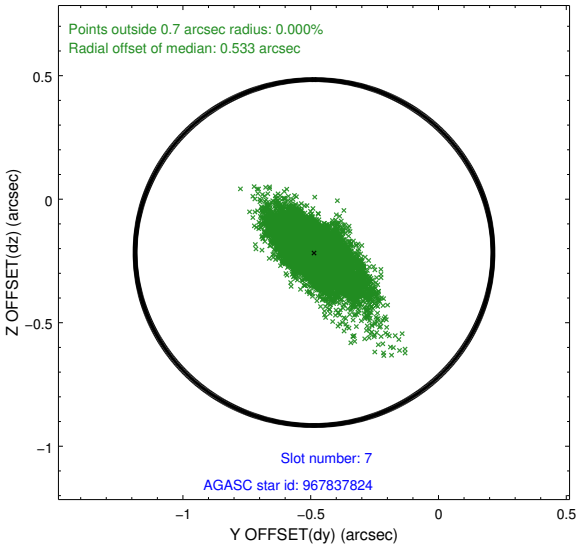

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 967185024

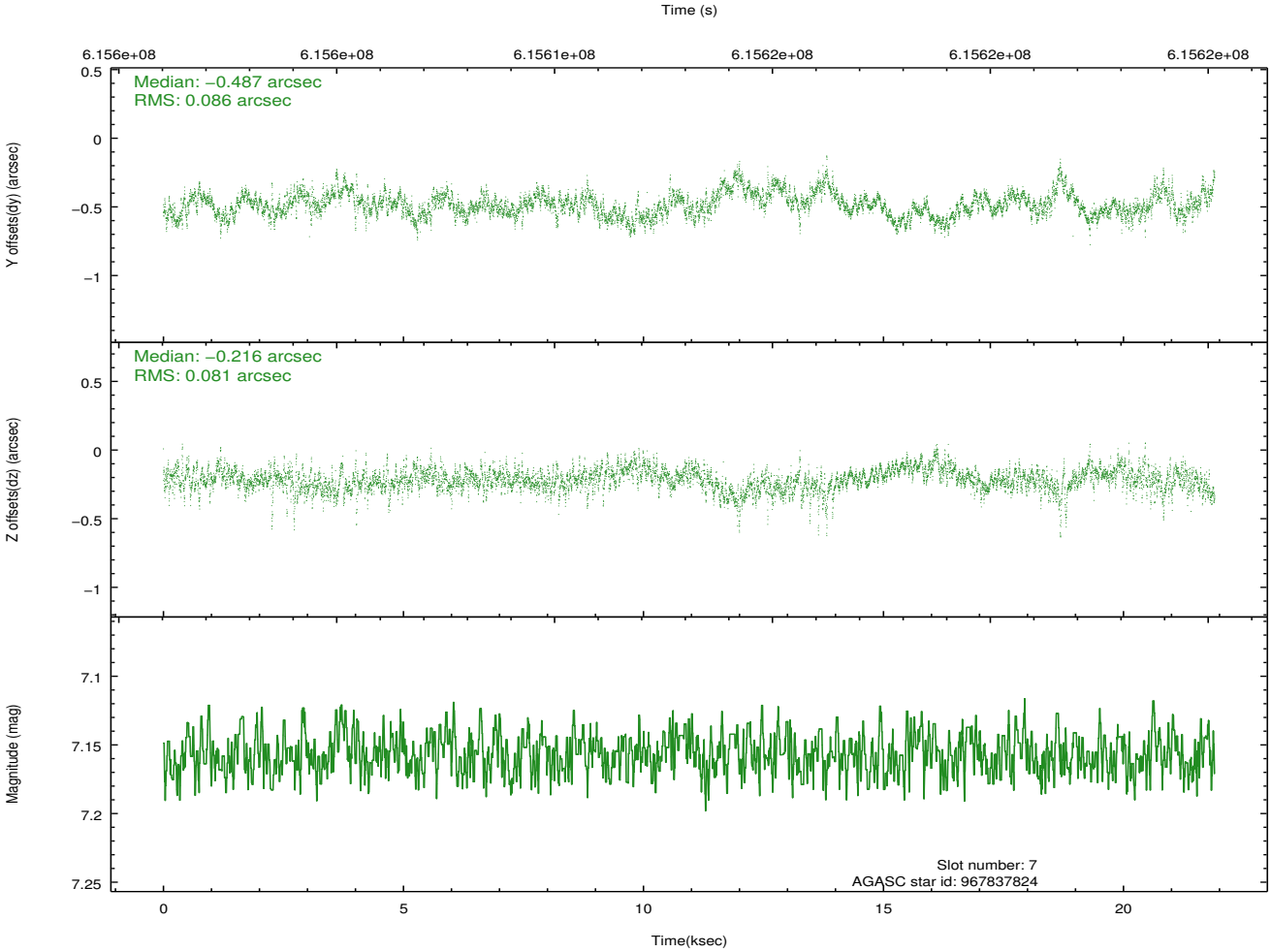

Points outside 0.7 arcsec radius: 0.009%
Radial offset of median: 0.378 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 967185024


Time (s)
Median: 0.373 arcsec
RMS: 0.085 arcsec
Y offsets(dy) (arcsec)
Median: −0.058 arcsec
RMS: 0.097 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 967185024
Time(ksec)

2.4.5 Slot 7

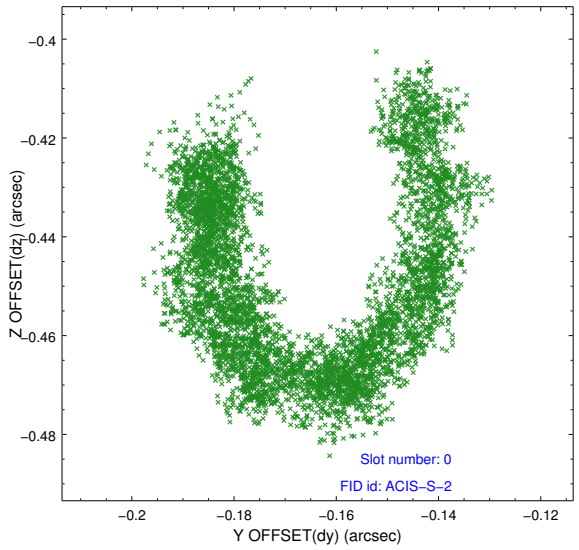

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 967837824

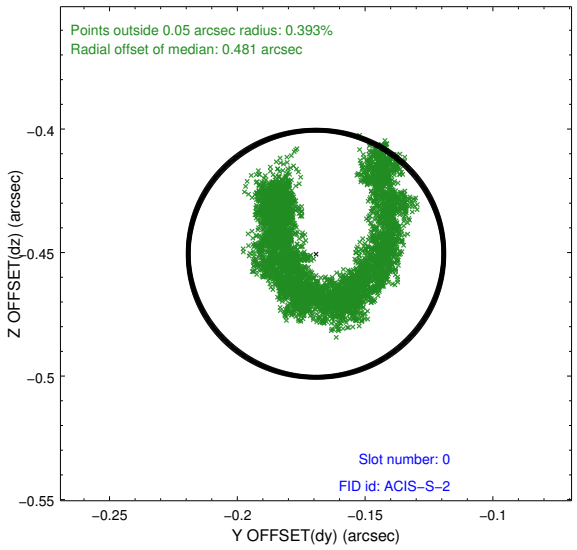

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.533 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 967837824

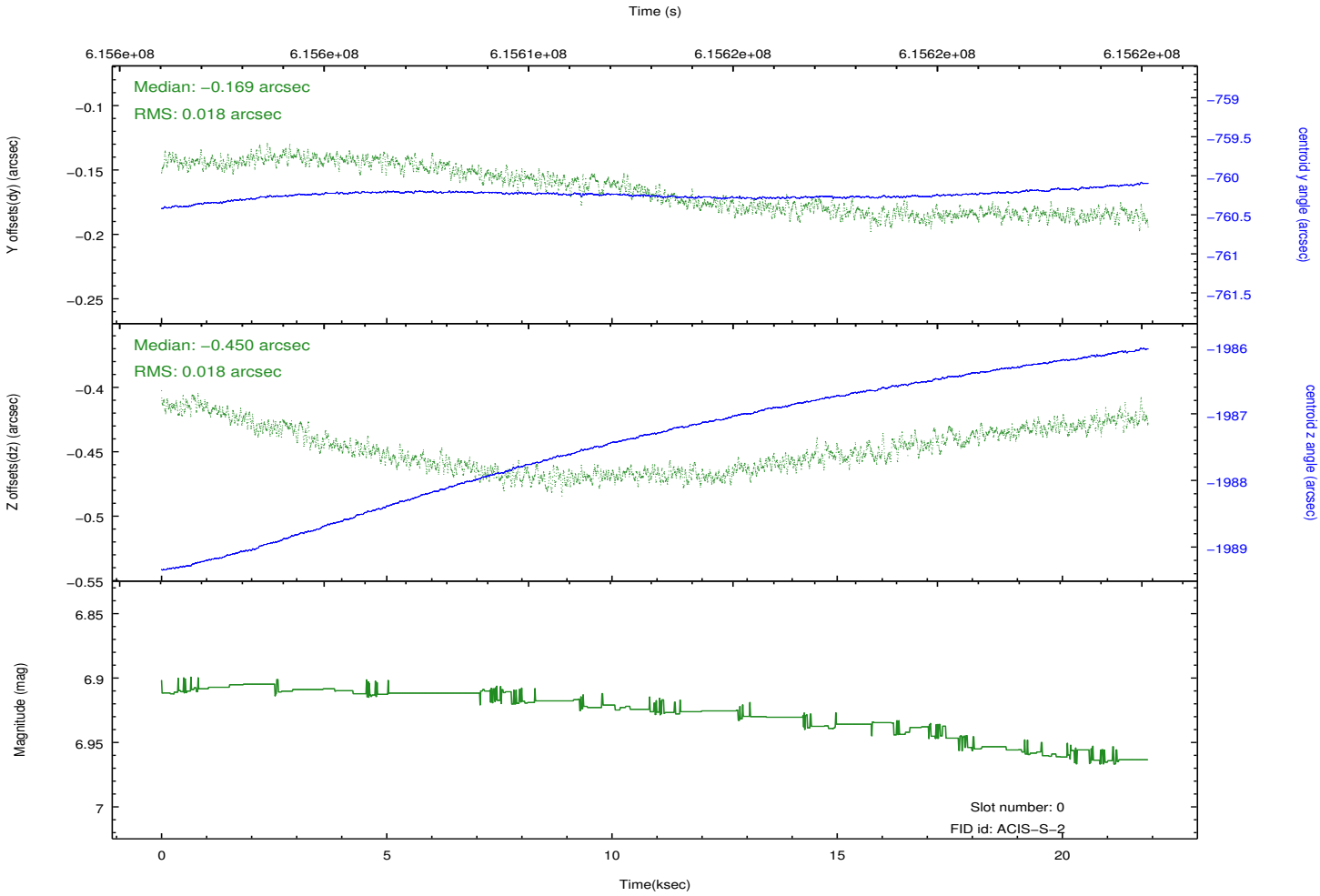

Time (s)
Median: −0.487 arcsec
RMS: 0.086 arcsec
Y offsets(dy) (arcsec)
Median: −0.216 arcsec
RMS: 0.081 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 967837824
Time(ksec)

2.5 FID Slots

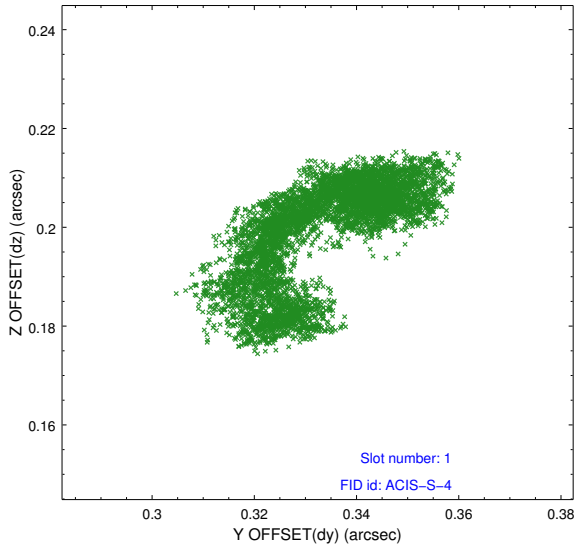
2.5.1 Slot 0

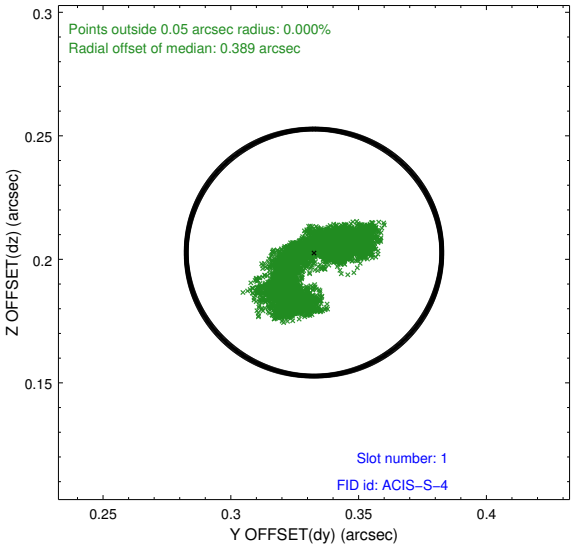


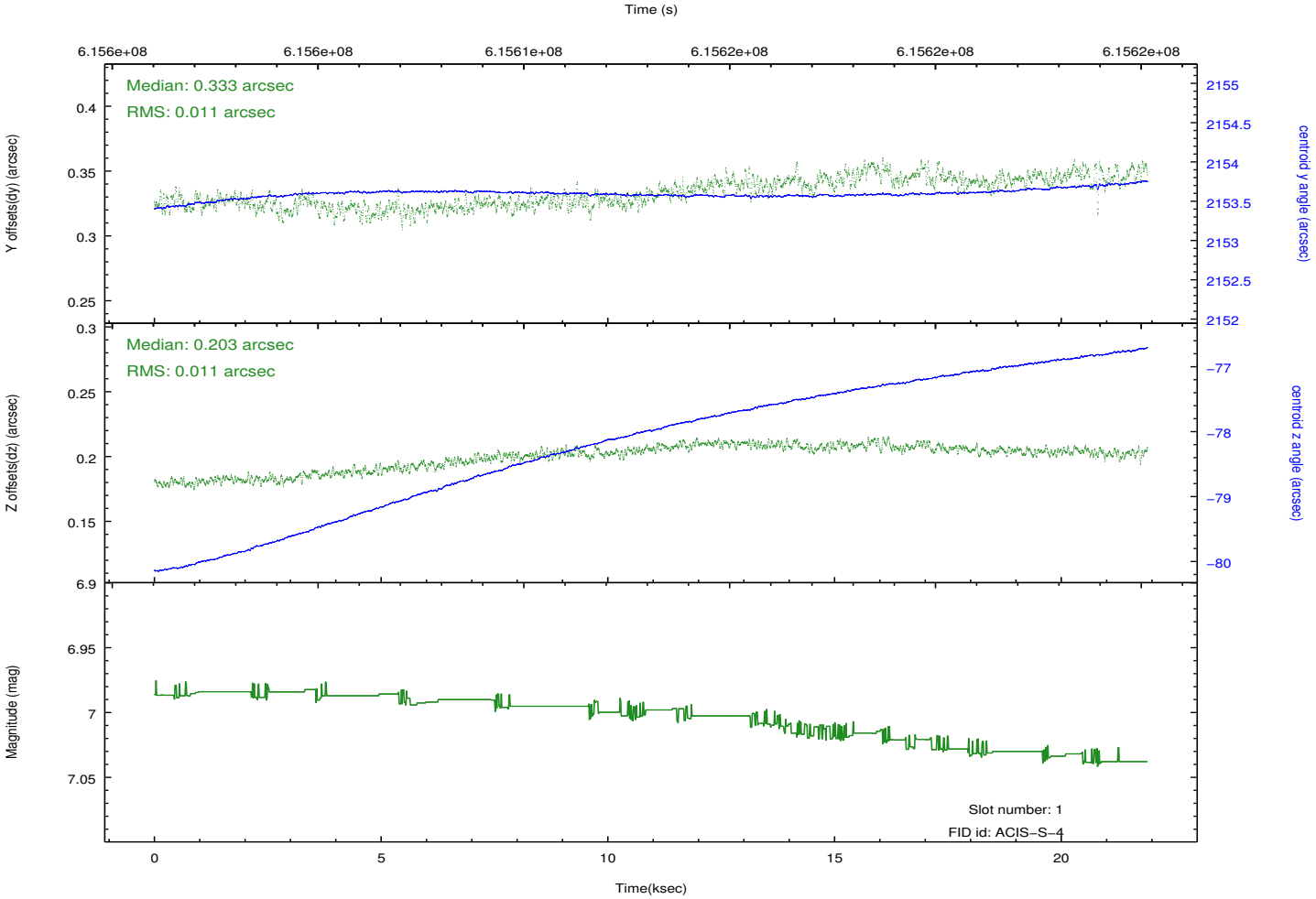




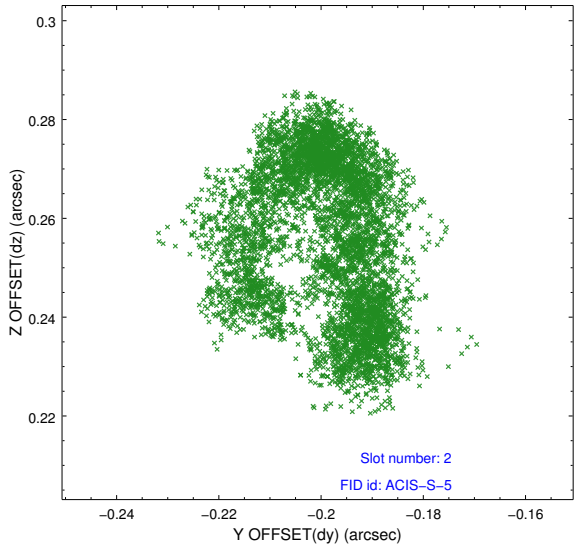
2.5.2 Slot 1

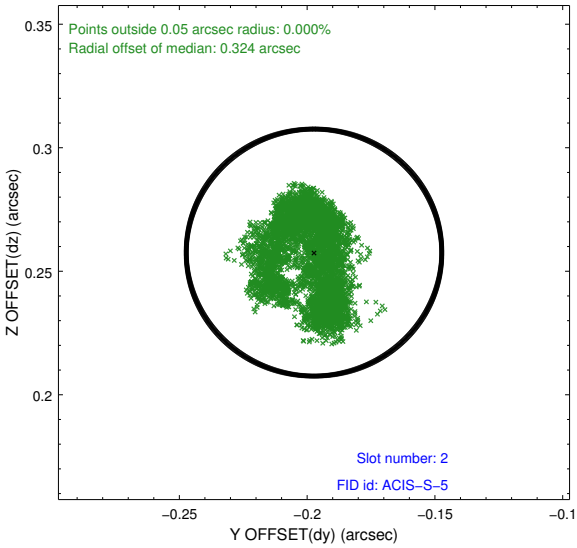

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4

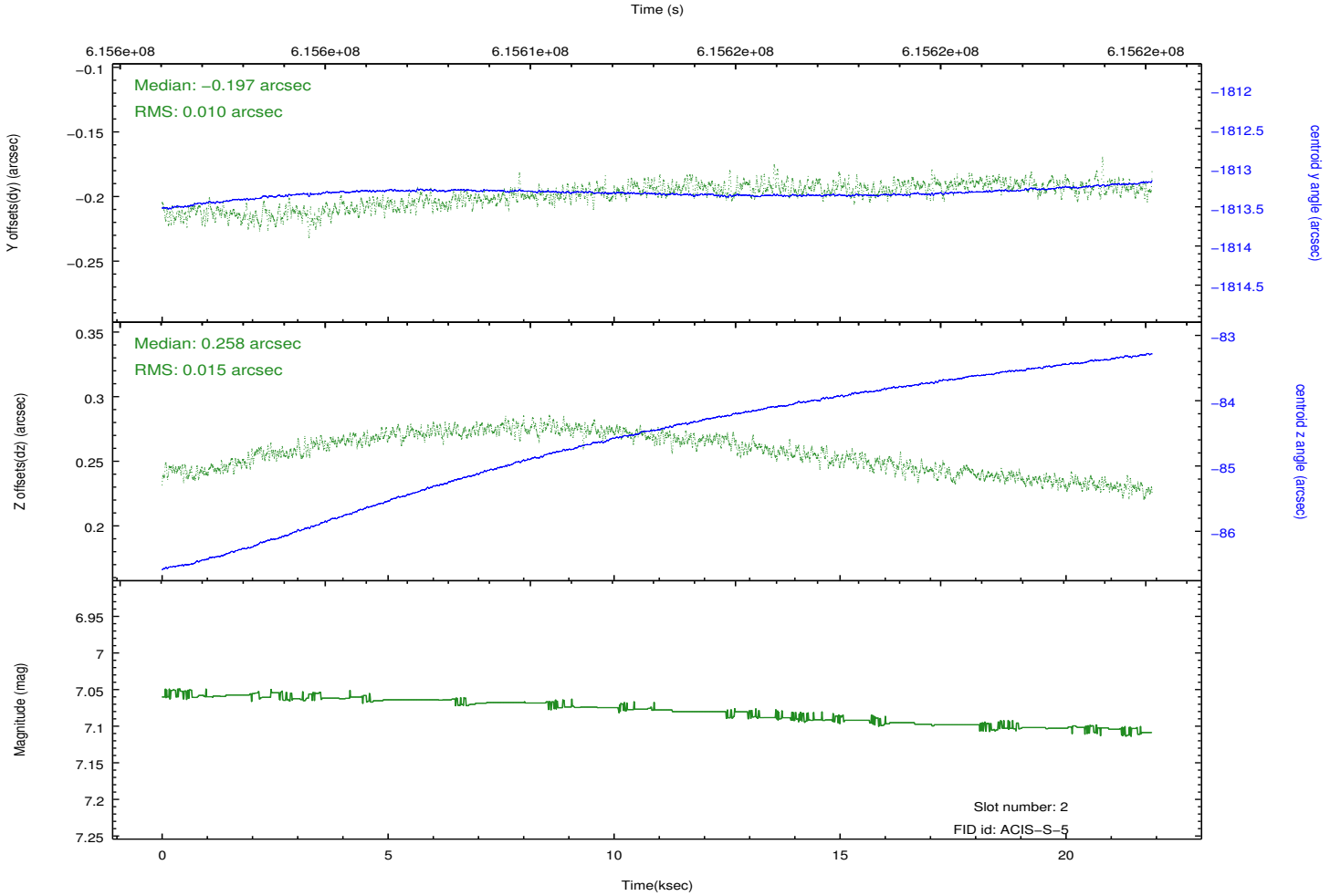

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.389 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4


Time (s)
Median: 0.333 arcsec
RMS: 0.011 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.203 arcsec
RMS: 0.011 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

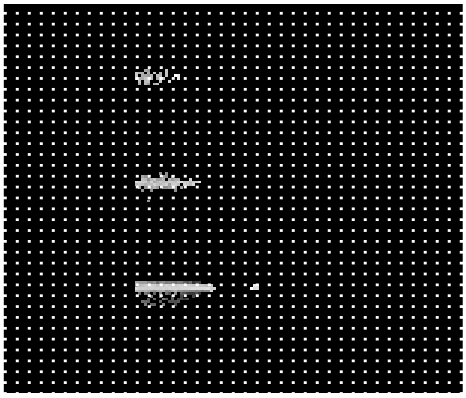

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5


Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.324 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5

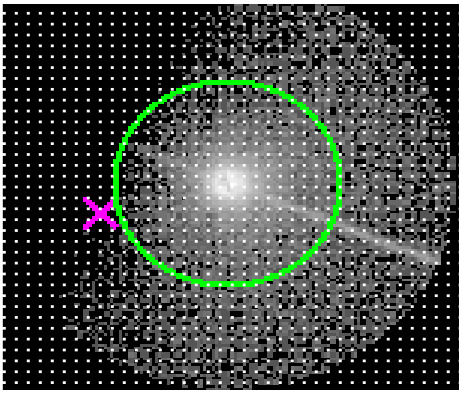

Time (s)
Median: −0.197 arcsec
RMS: 0.010 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.258 arcsec
RMS: 0.015 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 2
FID id: ACIS−S−5
Time(ksec)

3 Gratings

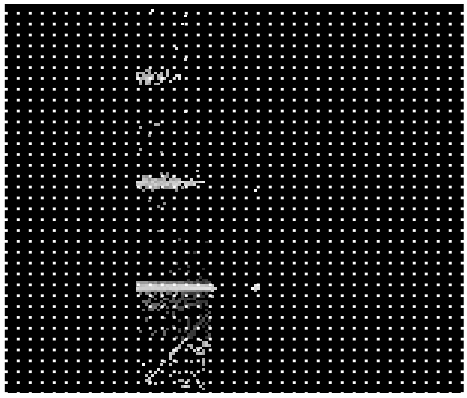
3.1 HEG Arm



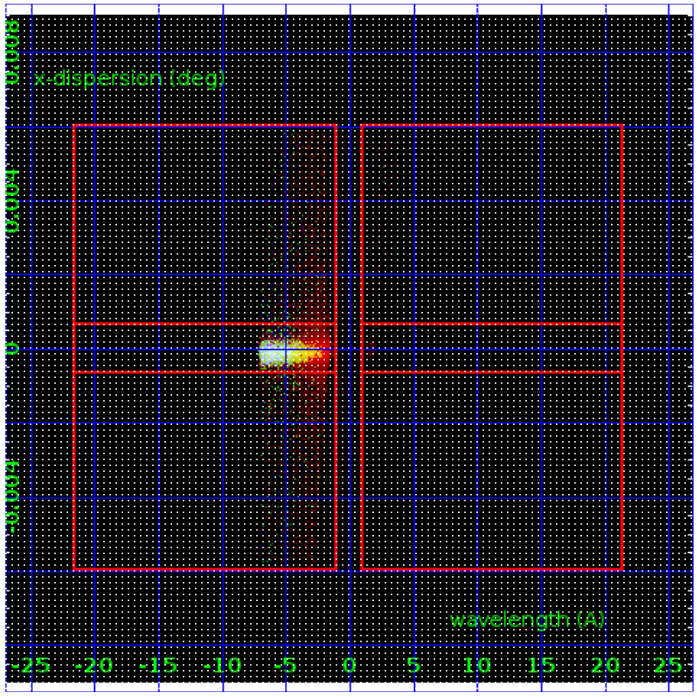
HEG Order Sort 123



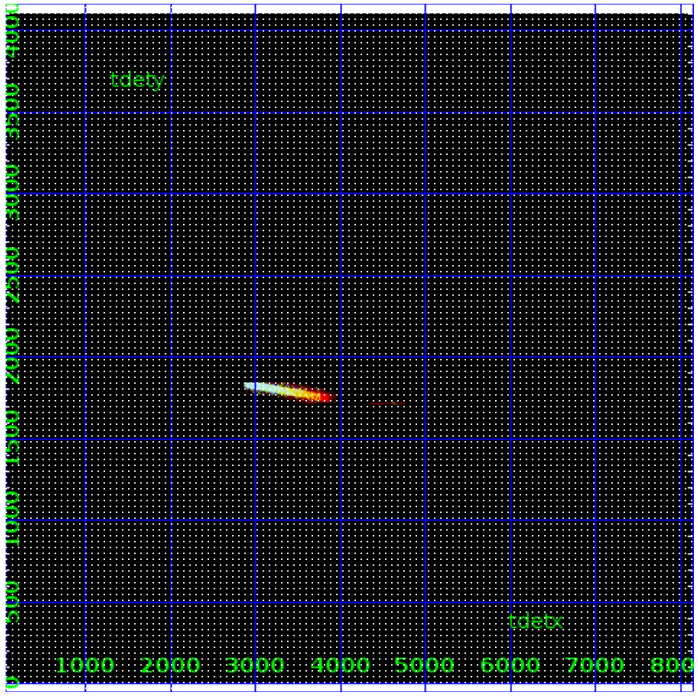
HEG Zero Order



HEG Order Sort ALL

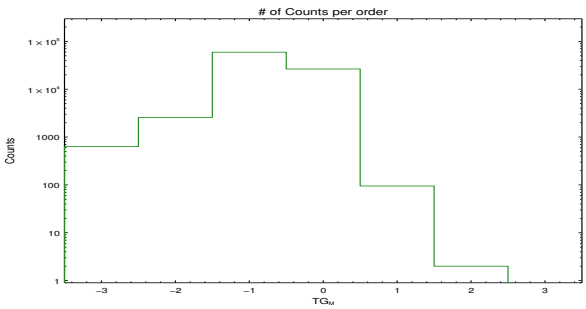


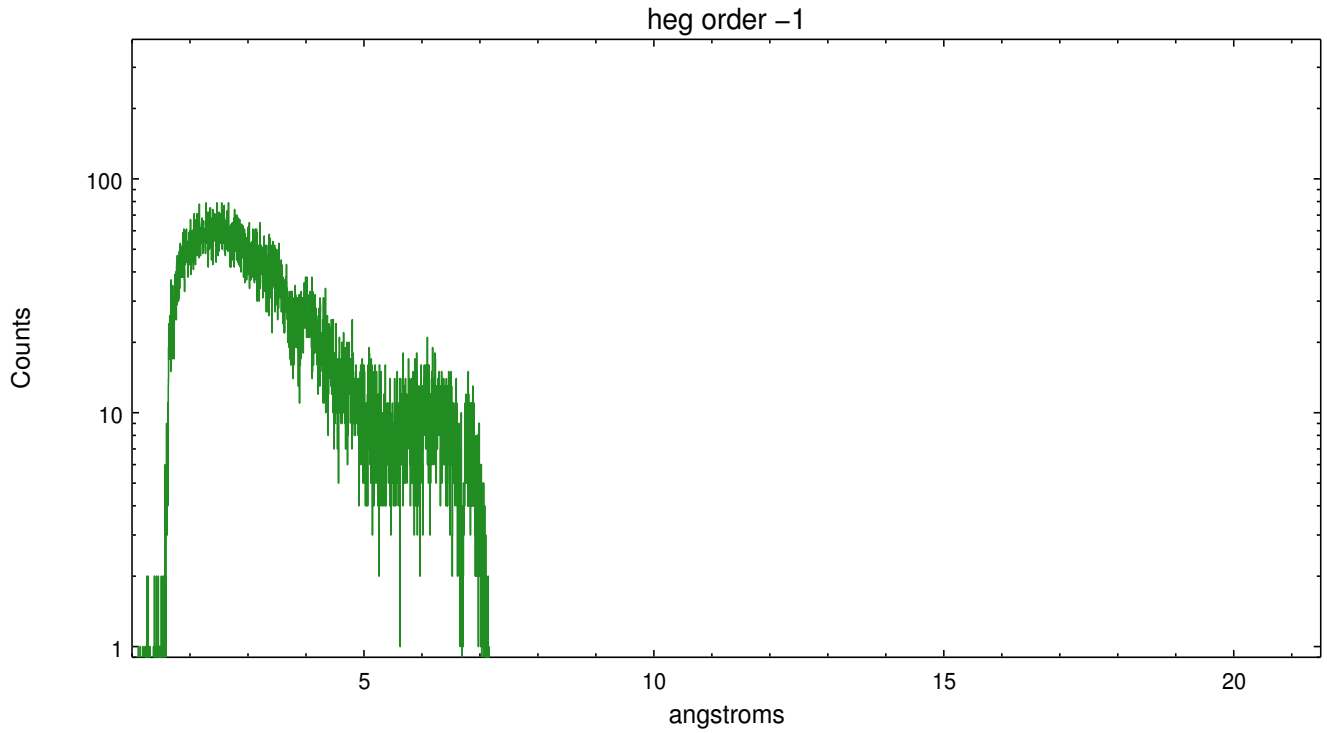
Spot Image HEG

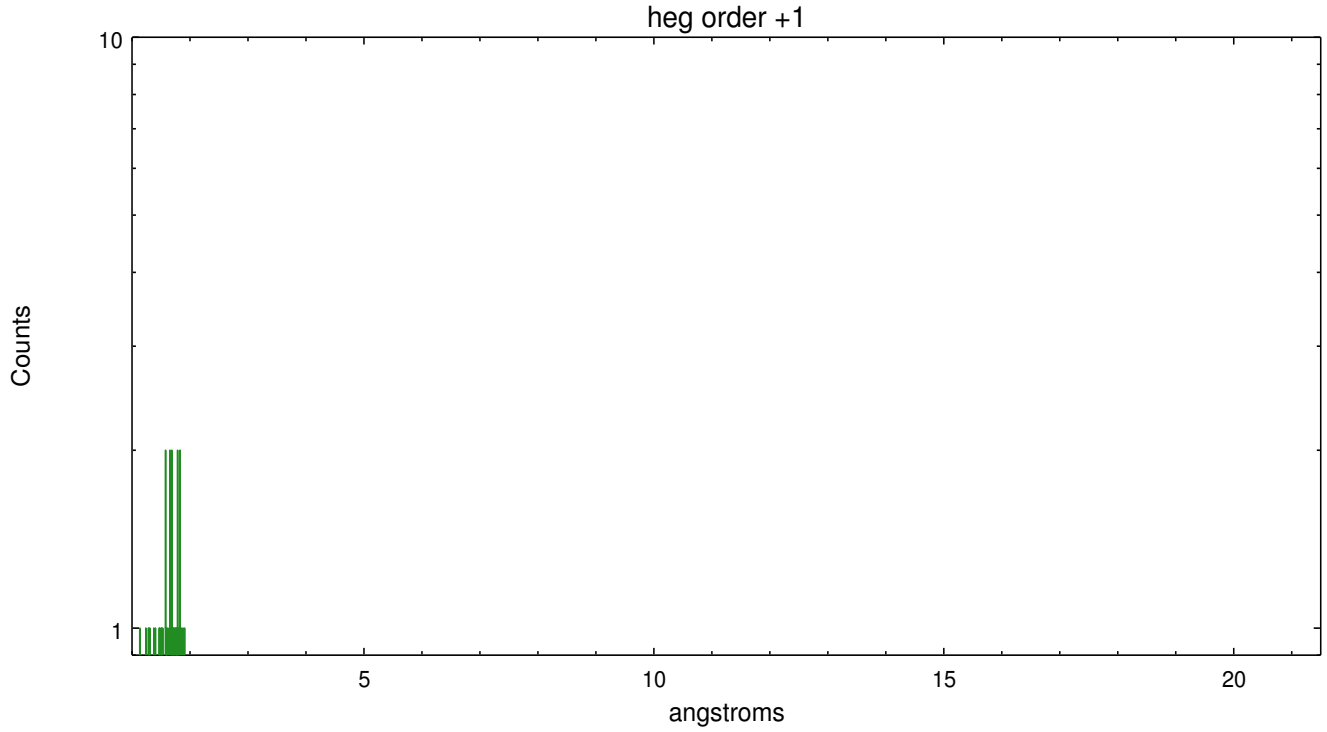


Full Detector HEG

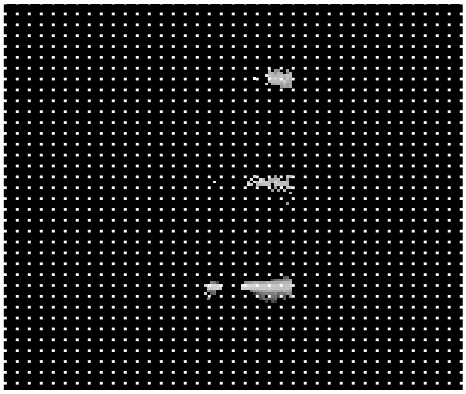
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	632	2570	59361	26492	95	2	0



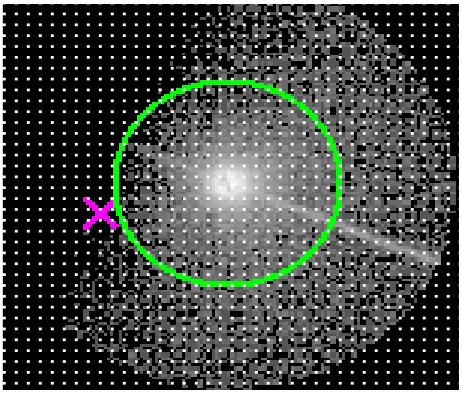

heg order −1
100
10
1
Counts
5
10
15
20
angstroms


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

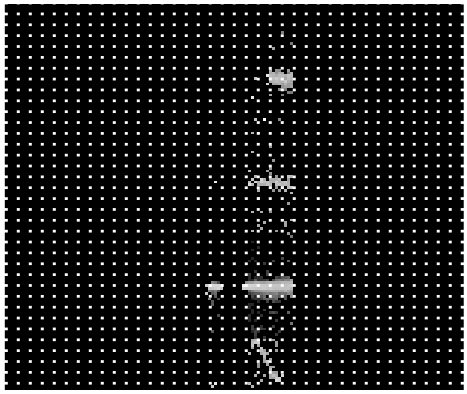
3.2 MEG Arm



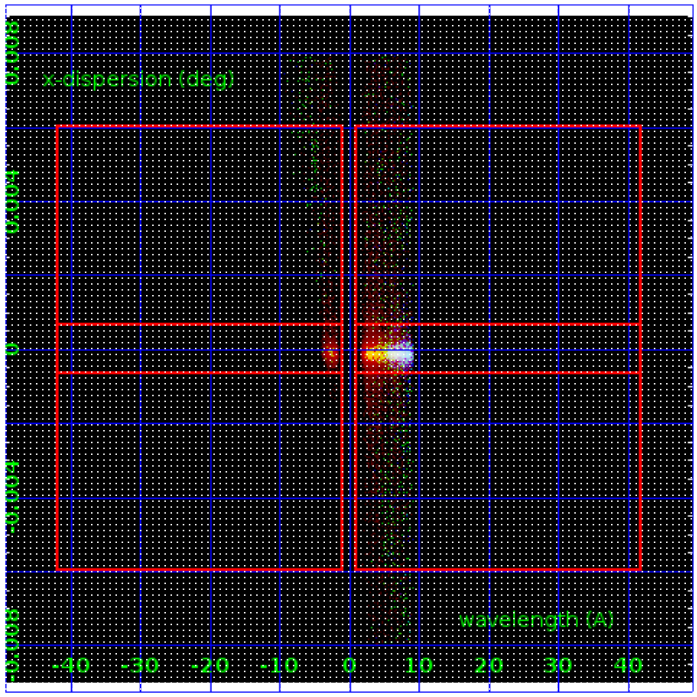
MEG Order Sort 123



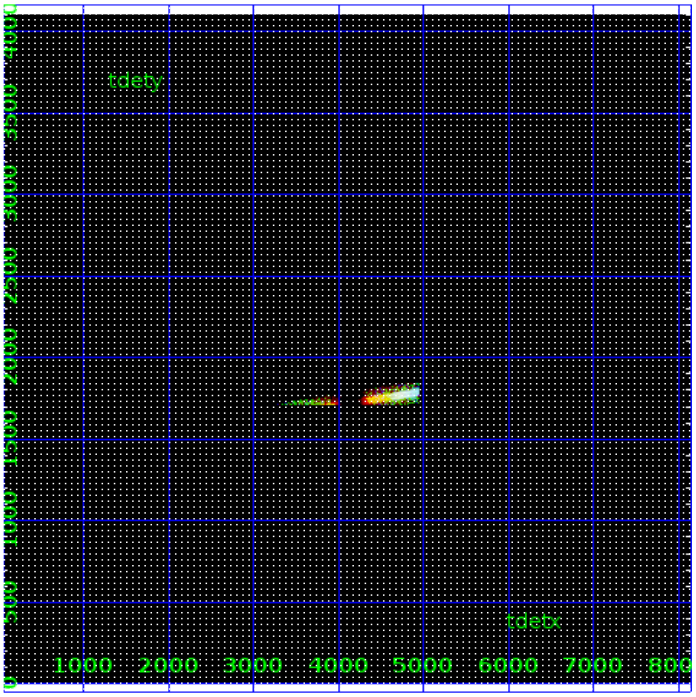
MEG Zero Order



MEG Order Sort ALL

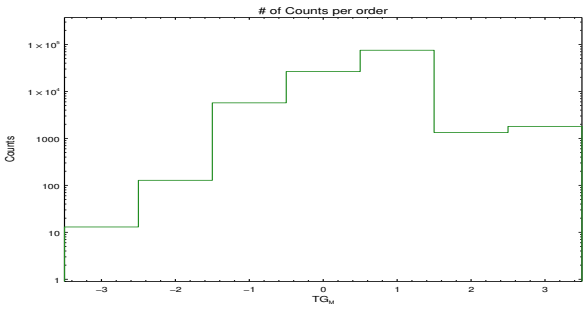


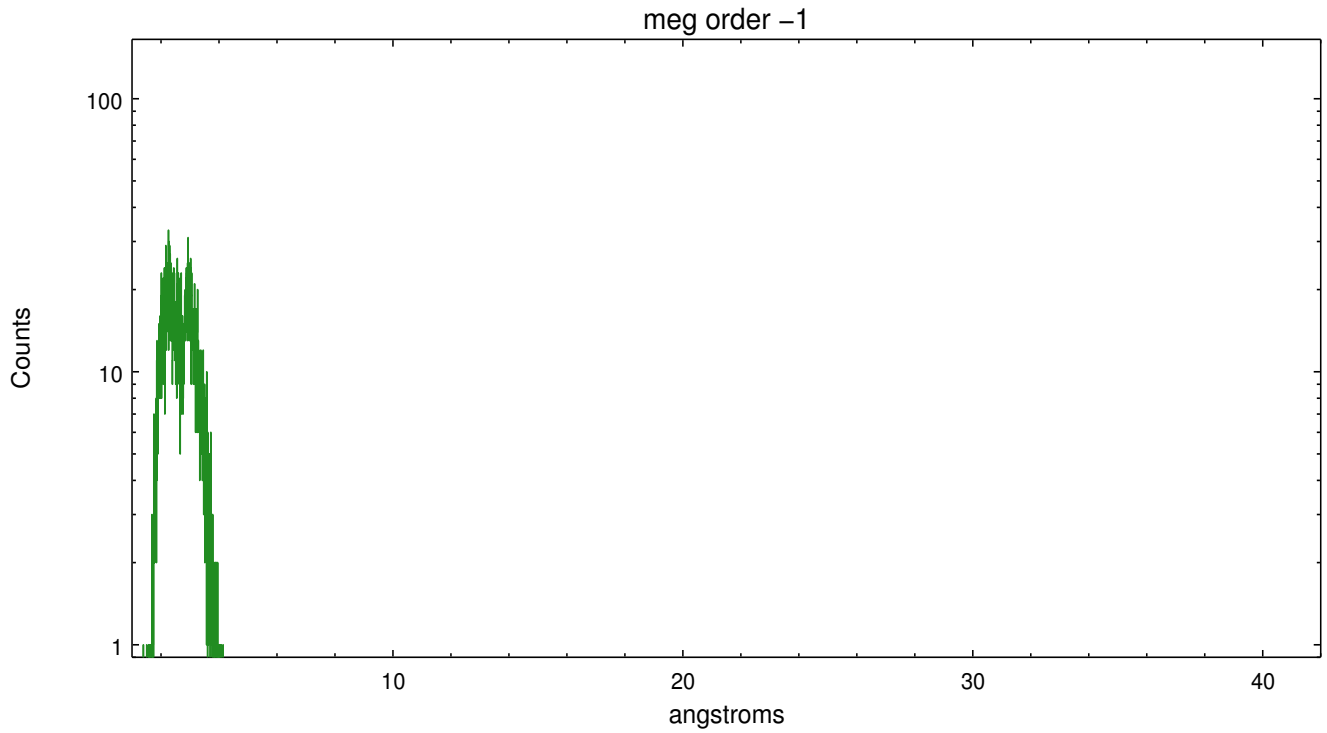
Spot Image MEG

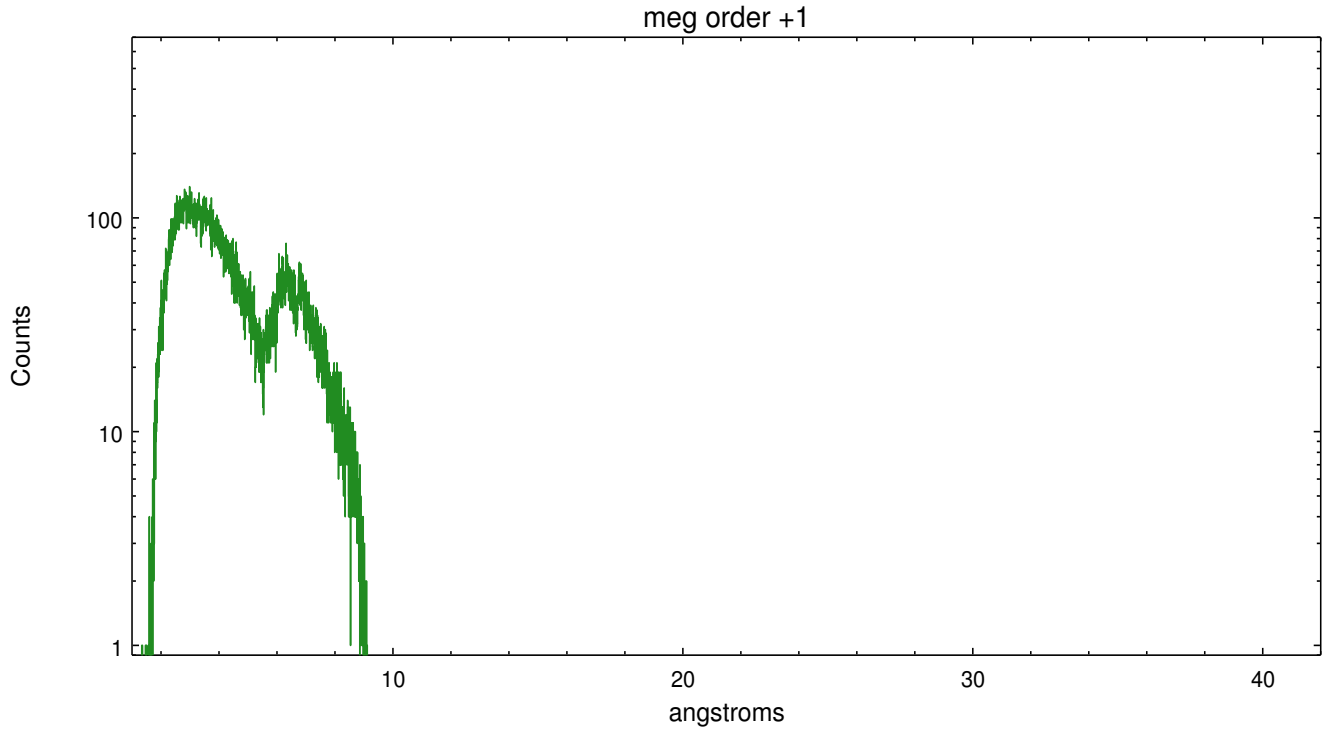


Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	13	128	5716	26492	75332	1334	1801




meg order −1
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)	2017.07.10
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	21.8925

A.2 Comments

```
Standard software processing technique using the tool findzo failed to
determine an accurate position for the zeroth order for this
observation. The source is extended and asymmetric. The zeroth order
position was specified manually to the approximate centroid of the
zeroth order (tgdetect result). This position is not at the coordinates
of the brightest emission. For grating analysis of localized X-ray
emission within the extended emission, the investigator will need to
extract one or more dispersed spectra using user-defined zeroth order
positions for all positions of interest.
==========
Faint grating spectra can be seen in an image of bad events. This is
probably due to pileup in the spectrum, causing migration to bad grades.
This should be considered in analysis.
```