

# V&V Reference Report

## L2 ASCDS Version : 10.6.4

Observation 20172 - L2 Version 1  
Chandra X-Ray Center

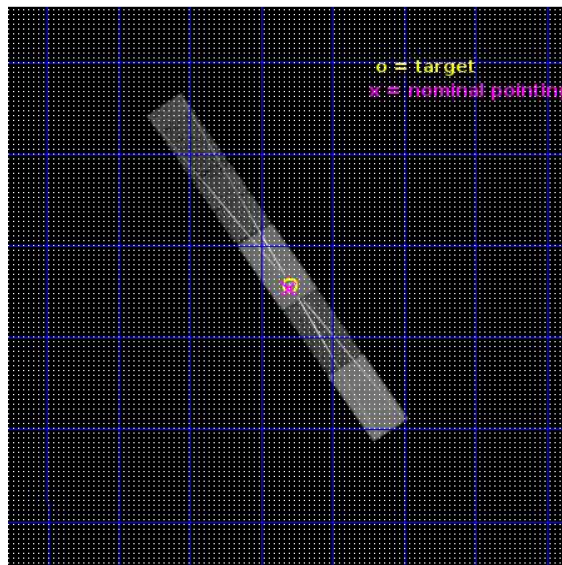
L2 Processing Date : Aug 1 2018

## Contents

<b>1</b>	<b>Front</b>	<b>2</b>
<b>2</b>	<b>OBI</b>	<b>3</b>
2.1	OBI . . . . .	3
2.1.1	Images . . . . .	3
2.1.2	Bias . . . . .	3
2.1.3	Parameters . . . . .	4
2.1.4	Events . . . . .	4
2.2	Compared Parameters . . . . .	5
2.3	Aspect . . . . .	6
2.4	Star Slots . . . . .	9
2.4.1	Slot 3 . . . . .	9
2.4.2	Slot 4 . . . . .	10
2.4.3	Slot 5 . . . . .	11
2.4.4	Slot 6 . . . . .	12
2.4.5	Slot 7 . . . . .	13
2.5	FID Slots . . . . .	14
2.5.1	Slot 0 . . . . .	14
2.5.2	Slot 1 . . . . .	15
2.5.3	Slot 2 . . . . .	16
<b>3</b>	<b>Gratings</b>	<b>17</b>
3.1	HEG Arm . . . . .	17
3.2	MEG Arm . . . . .	19
<b>A</b>	<b>Summary</b>	<b>21</b>
A.1	Status . . . . .	21
A.2	Comments . . . . .	21

# 1 Front

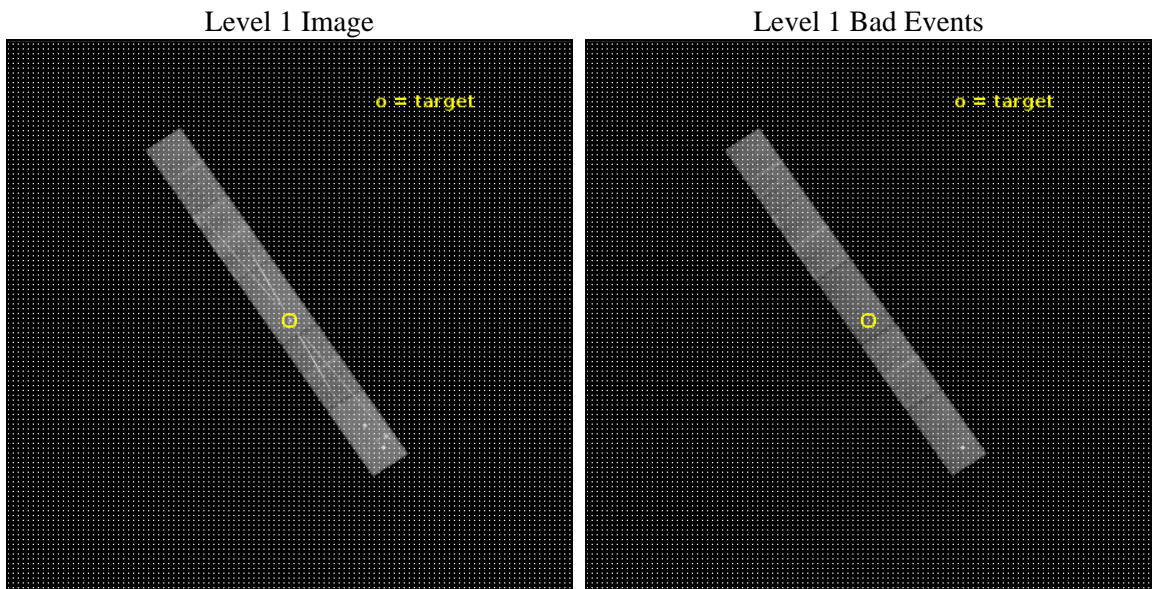
seq_num	401899	Sequence number
obs_id	20172	Observation id
title	An X-ray Outflow in an Ultracompact X-ray Binary	Proposal title
observer	Jon Miller	Principal investigator
object	4U 1916-053	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	289.699583	Observer's specified target RA [deg]
dec_targ	-5.238083	Observer's specified target Dec [deg]
ra_nom	289.70097471513	Nominal RA [deg]
dec_nom	-5.2445224715405	Nominal Dec [deg]
roll_nom	236.15677567668	Nominal Roll [deg]
revision	1	Processing version of data
ontime	30586.400857925	Sum of GTIs [s]
livetime	29865.414613377	Livetime [s]
ontime5	30586.400857925	Sum of GTIs [s]
ontime6	30584.659807801	Sum of GTIs [s]
ontime7	30586.400857925	Sum of GTIs [s]
ontime8	30586.400857925	Sum of GTIs [s]
ontime9	30586.400857925	Sum of GTIs [s]
l2events	336694	Number of level 2 events



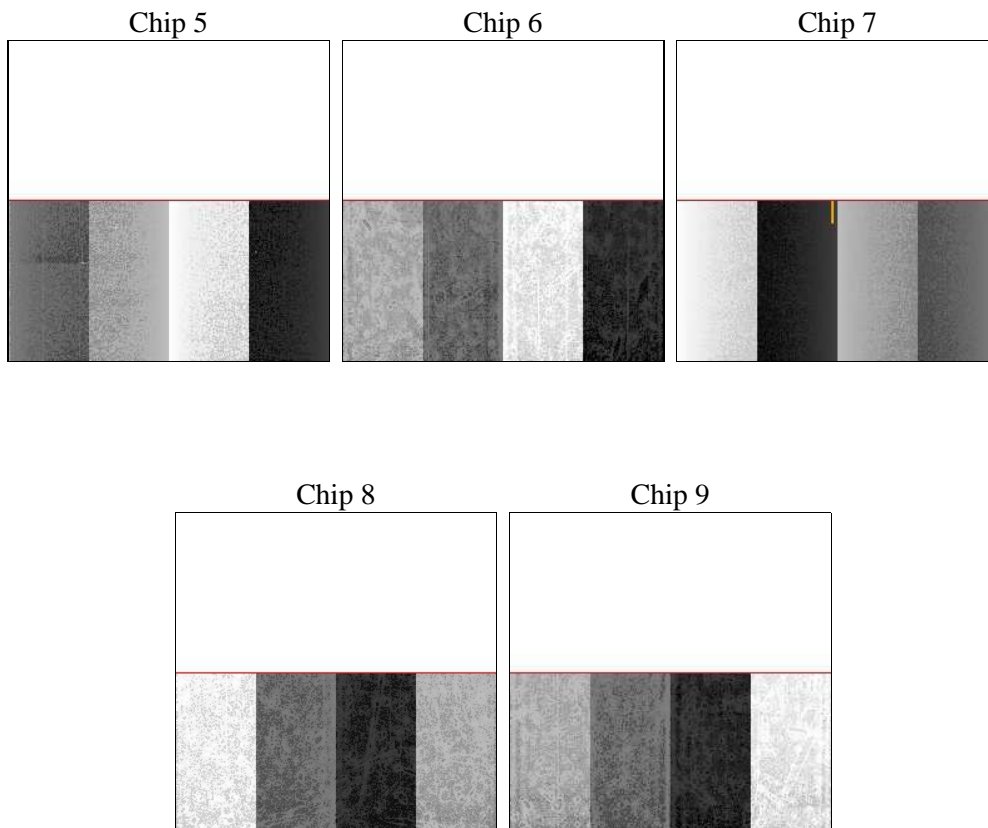
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	30500.000000	[s] Scheduled observation exposure time
ascdsver	10.6.4	Processing system revision	ontime	30586.400857925	Sum of GTIs [s]
caldsver	4.7.8	&#160	ontime5	30586.400857925	Sum of GTIs [s]
date	2018-08-01T06:04:19	Date and time of file creation	ontime6	30584.659807801	Sum of GTIs [s]
revision	1	Processing version of data	ontime7	30586.400857925	Sum of GTIs [s]
			ontime8	30586.400857925	Sum of GTIs [s]
			ontime9	30586.400857925	Sum of GTIs [s]
			l1events	938701	Number of level 1 events
			tgmethod	FINDZO	Method used to create src1a file
			zo_pos	(4108.42, 4143.96)	src1a sky pixel position

### 2.1.4 Events

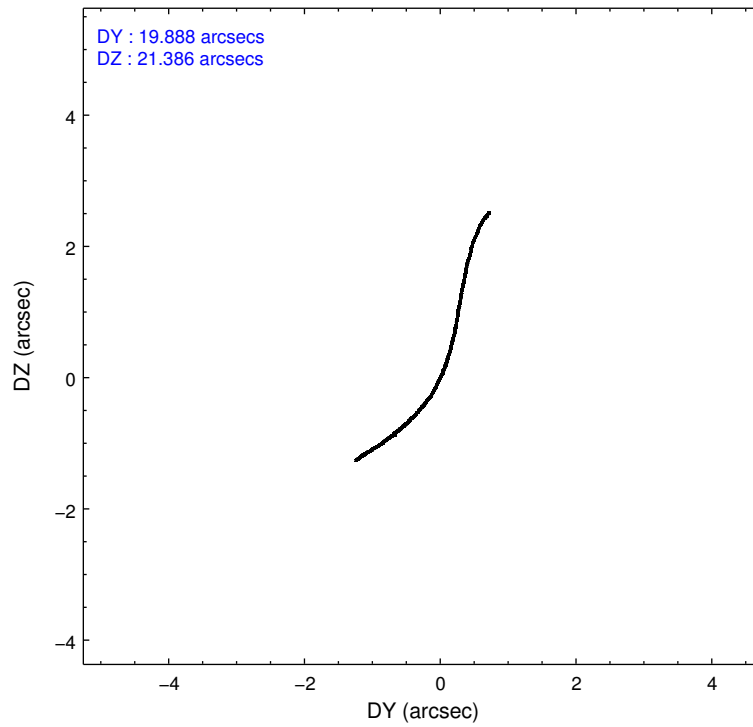
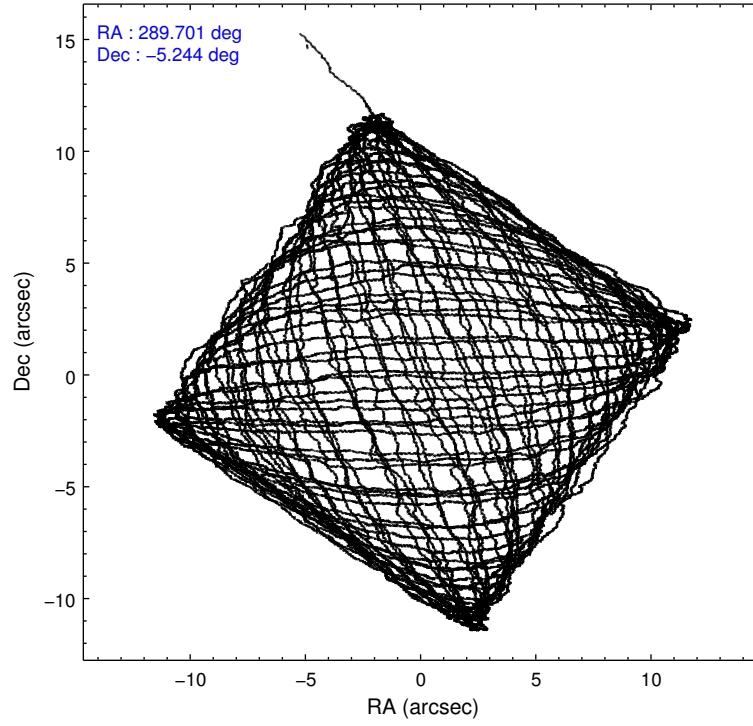
	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	234236	175729	223973	181579	123184
rejected events	106778	109739	91070	116417	105024
rejected %	45%	62%	40%	64%	85%

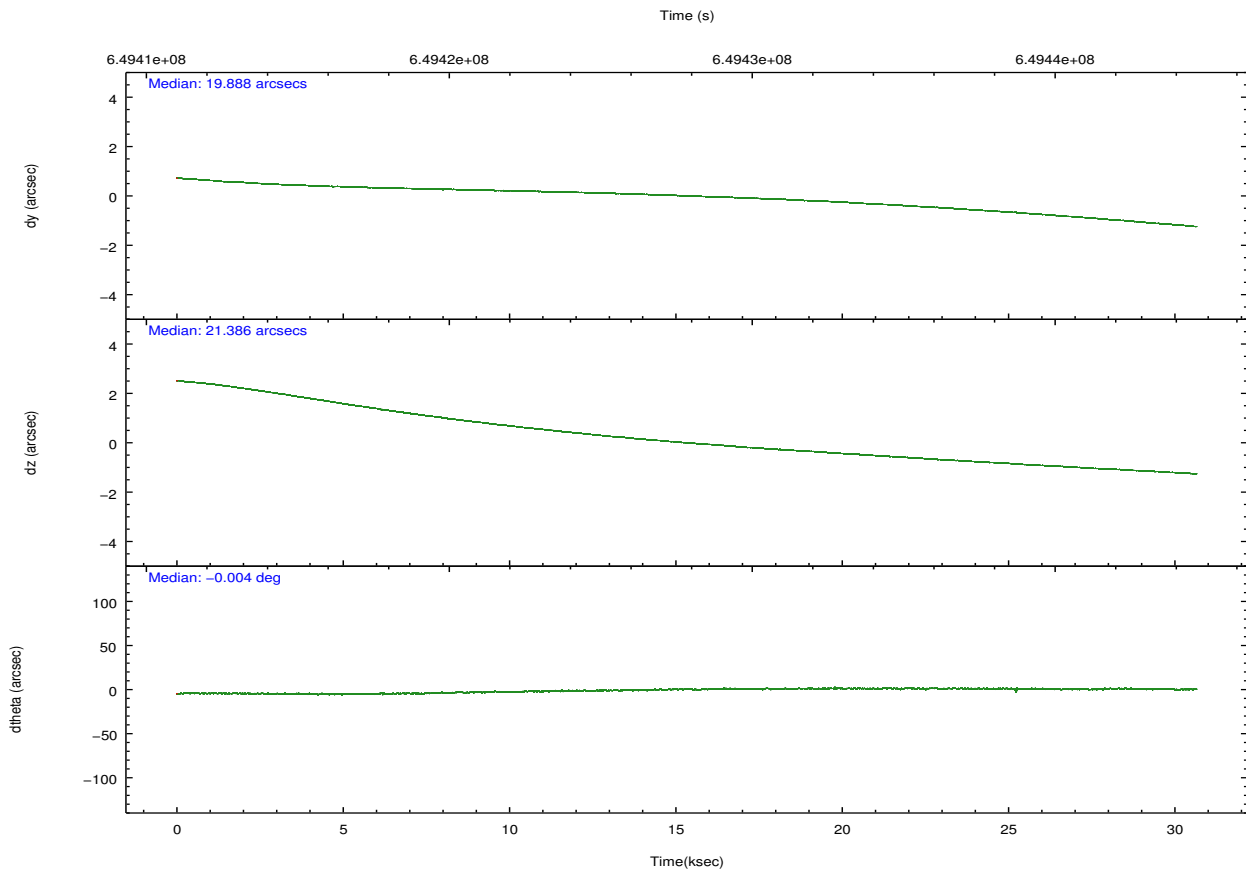
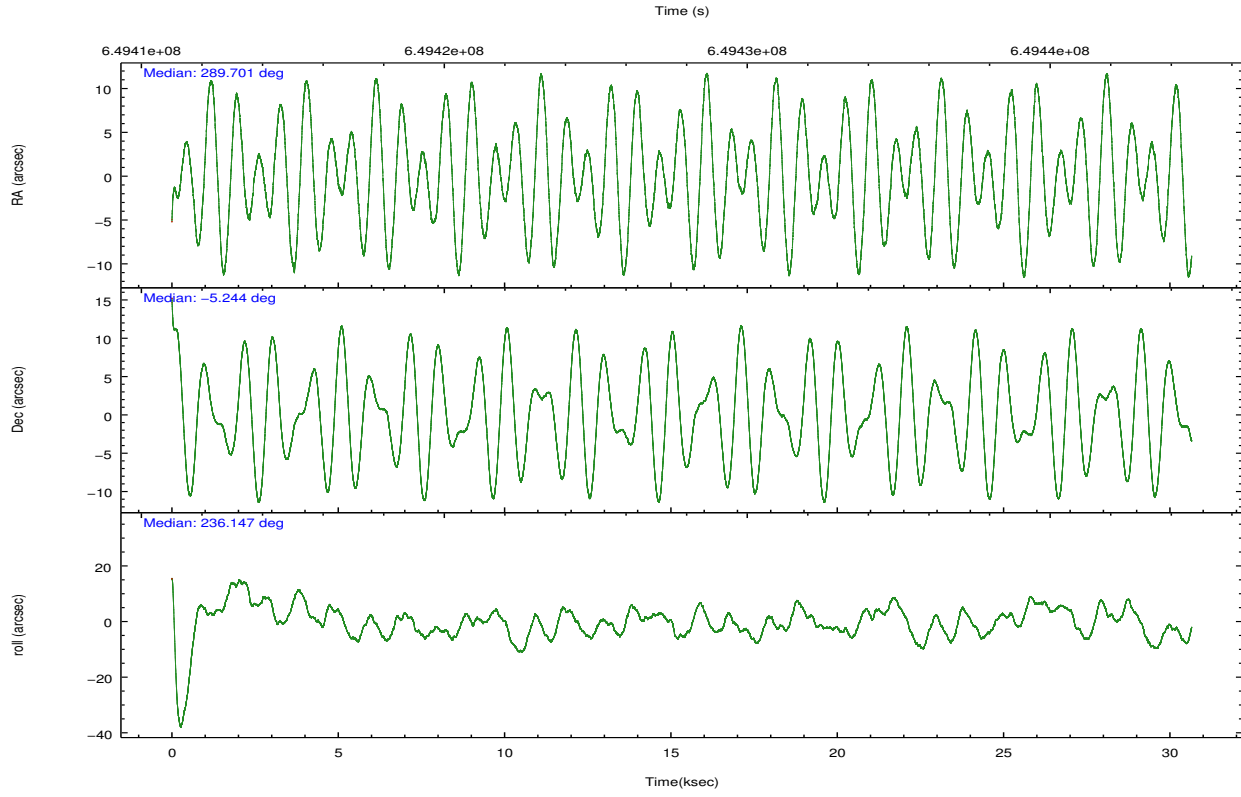
	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
grade 0 events	31863	43721	19590	27861	7621
	13%	24%	8%	15%	6%
grade 1 events	411	240	590	165	50
	0%	0%	0%	0%	0%
grade 2 events	32887	9718	30543	12844	3709
	14%	5%	13%	7%	3%
grade 3 events	7149	3616	13102	5933	1862
	3%	2%	5%	3%	1%
grade 4 events	5450	3596	13197	5628	1756
	2%	2%	5%	3%	1%
grade 5 events	16861	5650	17797	8088	5821
	7%	3%	7%	4%	4%
grade 6 events	50132	5346	56491	12901	3216
	21%	3%	25%	7%	2%
grade 7 events	89483	103842	72663	108159	99149
	38%	59%	32%	59%	80%

## 2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-56789	ACIS-56789	Obspar file type	PREDICTED	ACTUAL
Grating	HETG	HETG	Obspar update status	NONE	UPDATED
Data mode	FAINT	FAINT	CCD I0 on	N	N
Observation mode	POINTING	POINTING	CCD I1 on	N	N
[deg] Pointing RA	289.702466	289.7009747151295	CCD I2 on	N	N
[deg] Pointing Dec	-5.217129	-5.244522471540469	CCD I3 on	N	N
[deg] Pointing Roll	236.000262	236.156775676675	CCD S0 on	O1	N
[mm] SIM focus pos	-0.684267	-0.6828225247311905	CCD S1 on	Y	Y
[mm] SIM defocus	0	0.001444936568705701	CCD S2 on	Y	Y
[mm] SIM translation stage pos	-183.992523	-183.9875365069546	CCD S3 on	Y	Y
[mm] SIM translation stage offset	-6.14	-6.144986076053243	CCD S4 on	Y	Y
[s] Observation start time (MET)	649412670.184000	649411397.03008	CCD S5 on	Y	Y
Observation start date	2018-07-31T08:23:21	2018-07-31T08:03:17	Number of optional ACIS chips dropped	1	1
[s] Observation end time (MET)	649443170.184000	649444040.20702	On-chip summing requested	N	N
Observation end date	2018-07-31T16:51:41	2018-07-31T17:07:20	Subarray requested	CUSTOM	1/2
Read mode	TIMED	TIMED	Subarray start row	1	1
			Subarray row count	512	512
			Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	1.7

## 2.3 Aspect



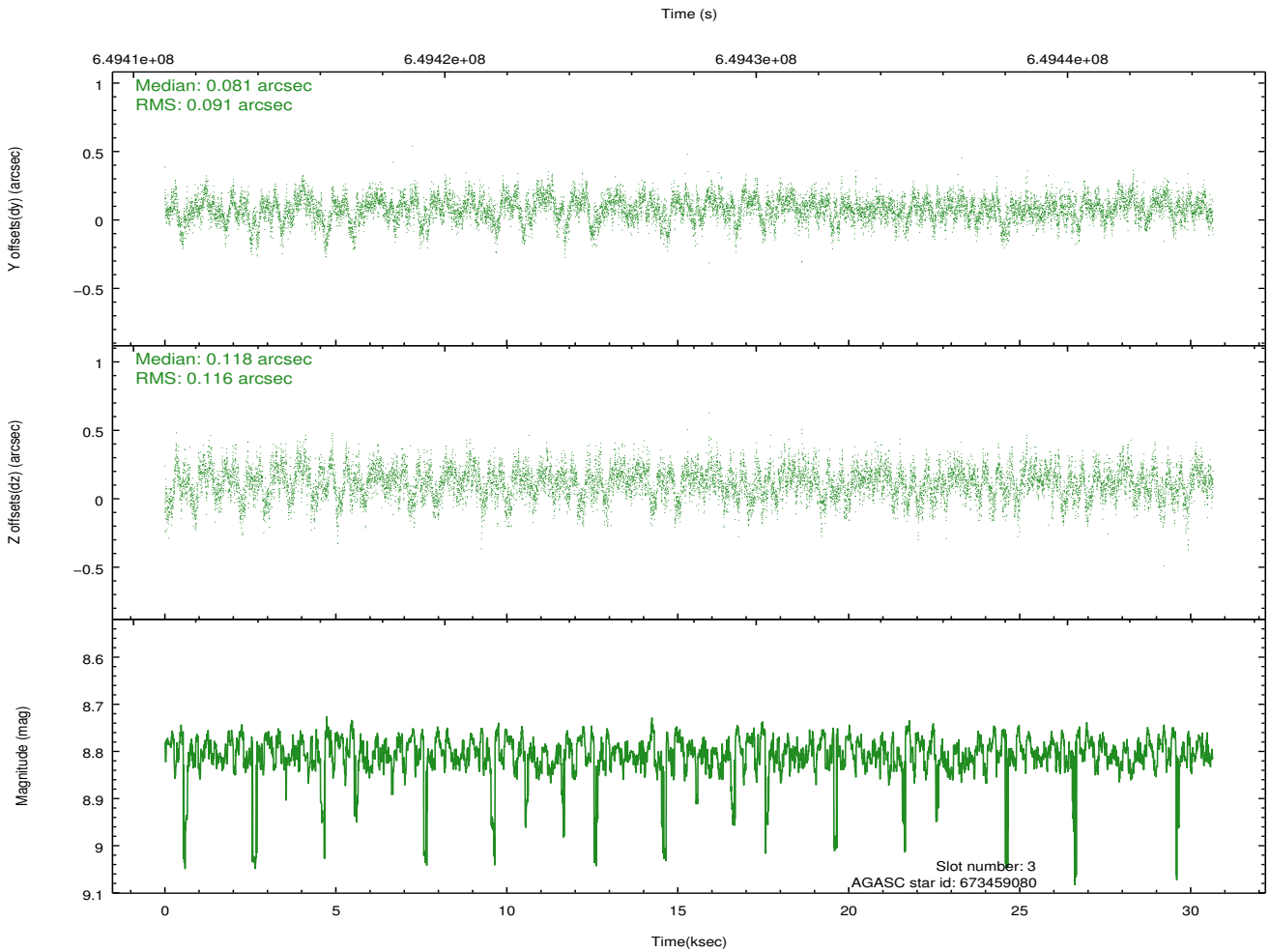
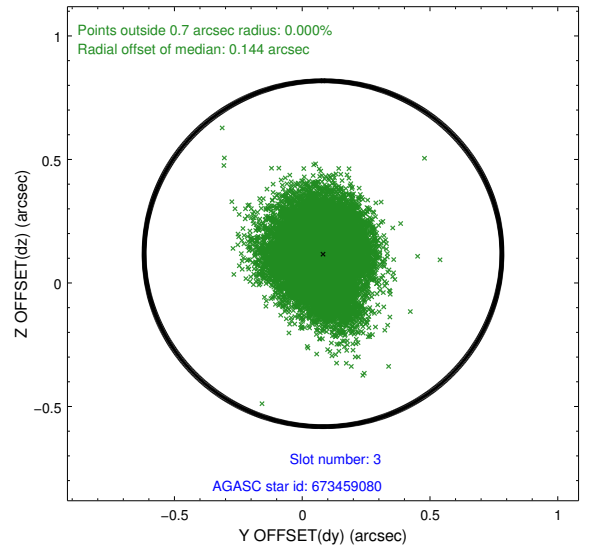
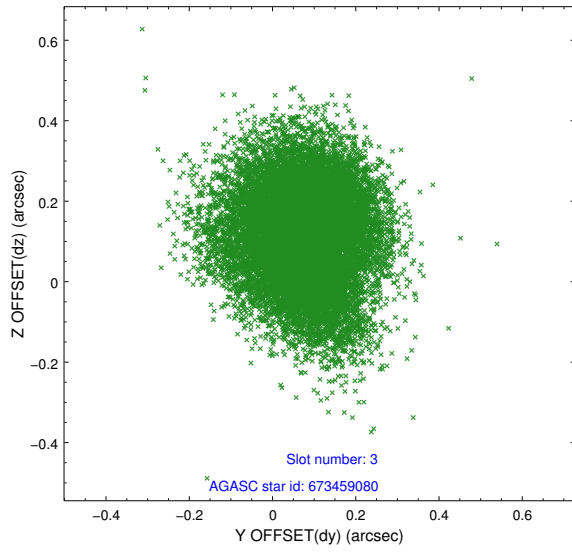


### Slot Statistics

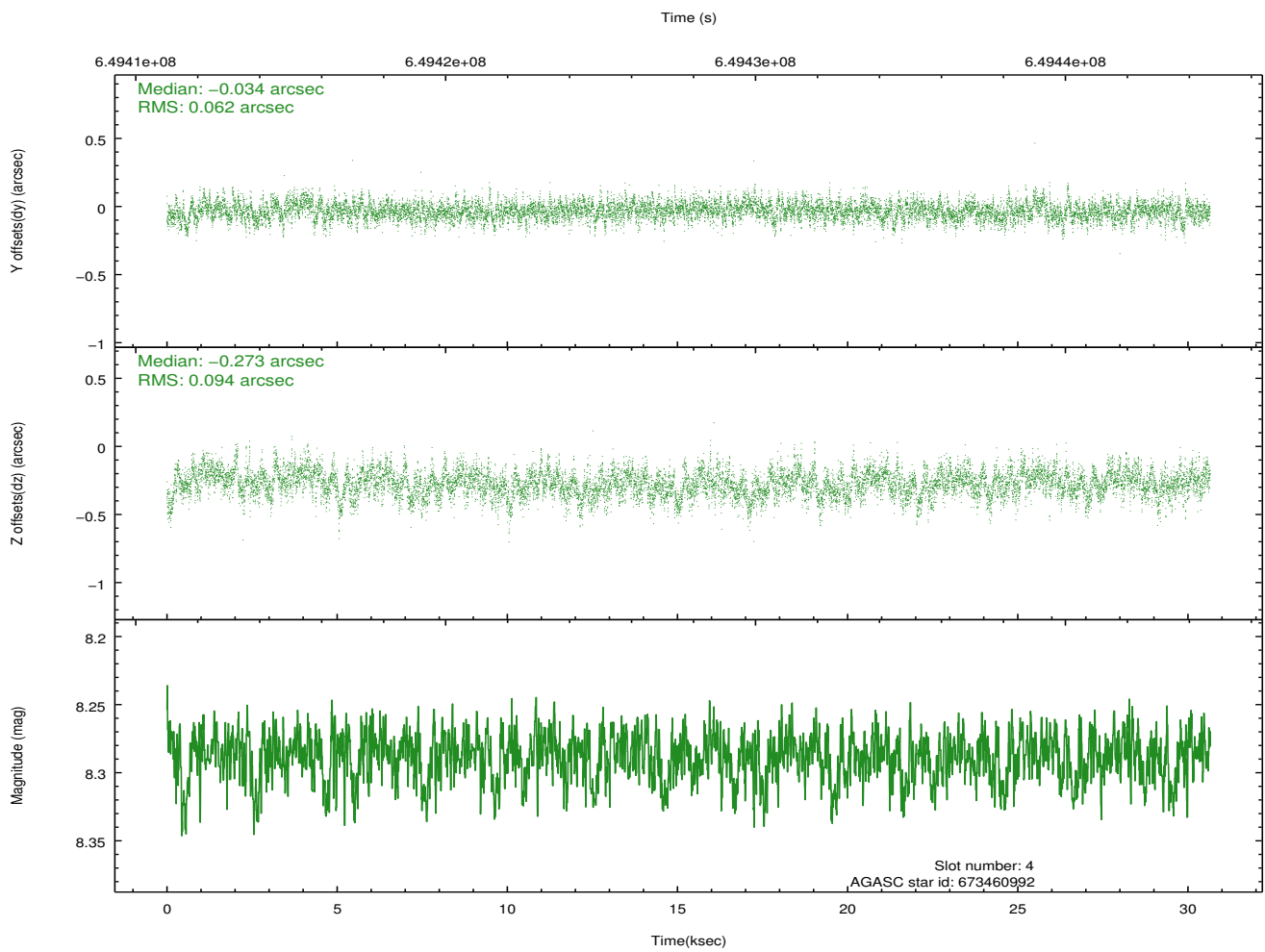
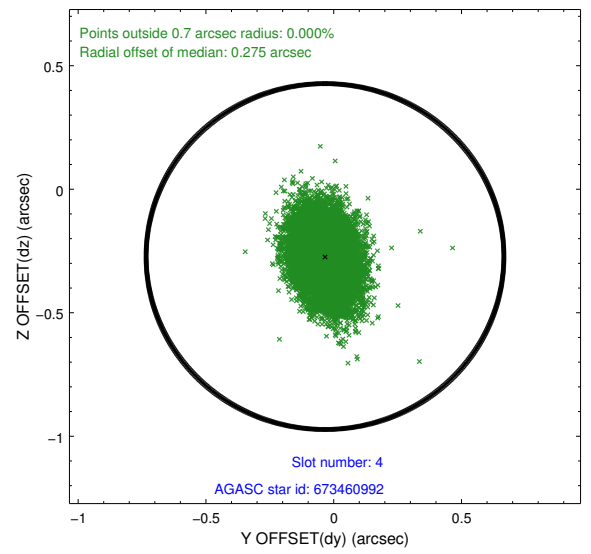
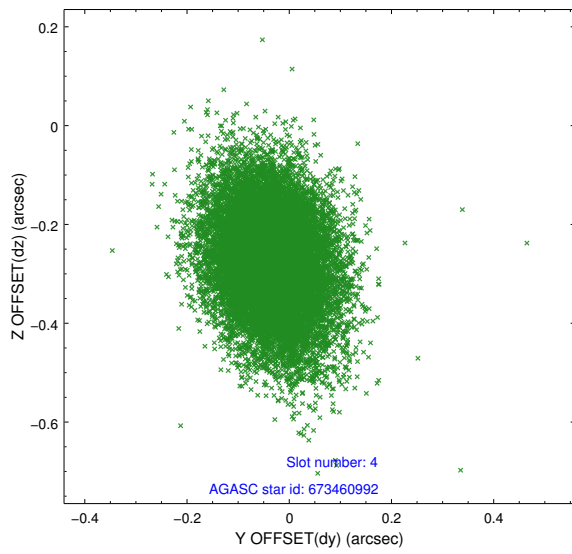
slot	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_x
0	FID		ACIS-S-2	6.98	7477	1.000	-0.262	-0.124	0.052	0.070	0.000000	0.000000	-772.68	-1869
1	FID		ACIS-S-4	7.09	7477	1.000	0.571	0.160	0.017	0.054	0.000000	0.000000	2141.37	38
2	FID		ACIS-S-5	7.13	7475	1.000	-0.336	-0.028	0.048	0.062	0.000000	0.000000	-1825.53	32
3	GUIDE	used	673459080	8.81	14921	1.000	0.081	0.118	0.157	0.255	289.246637	-5.373686	1382.04	-1038
4	GUIDE	used	673460992	8.29	14945	1.000	-0.034	-0.273	0.117	0.201	289.799374	-5.232721	-147.14	319
5	GUIDE	used	673463704	8.94	14945	1.000	0.007	0.178	0.148	0.242	289.894494	-4.869892	-1420.91	-127
6	GUIDE	used	673466464	9.23	14927	1.000	-0.349	-0.314	0.184	0.298	289.850458	-5.613937	887.34	1238
7	GUIDE	used	673455744	9.49	14887	1.000	0.285	0.303	0.248	0.408	289.673010	-4.488976	-2113.30	-1552

## 2.4 Star Slots

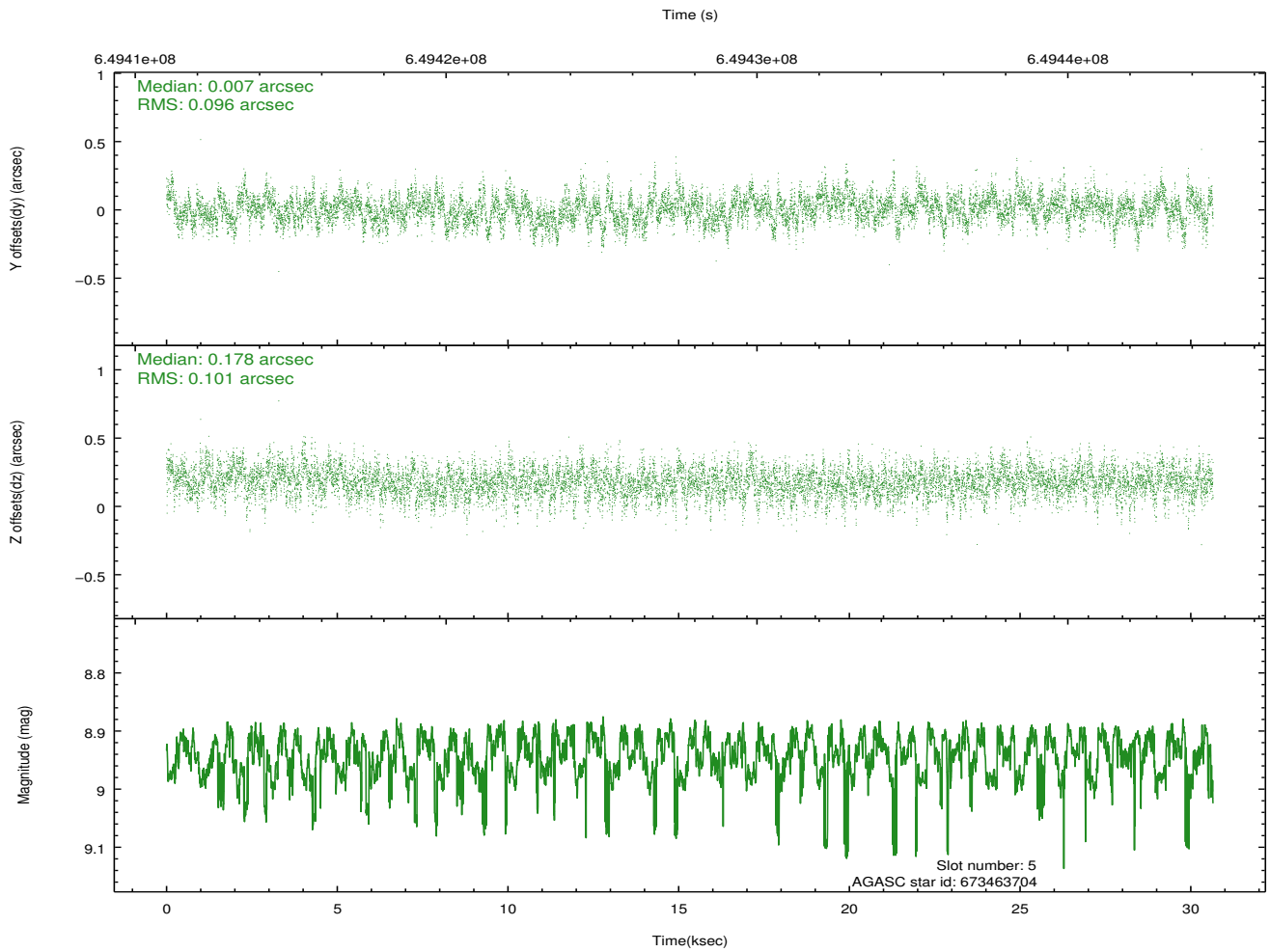
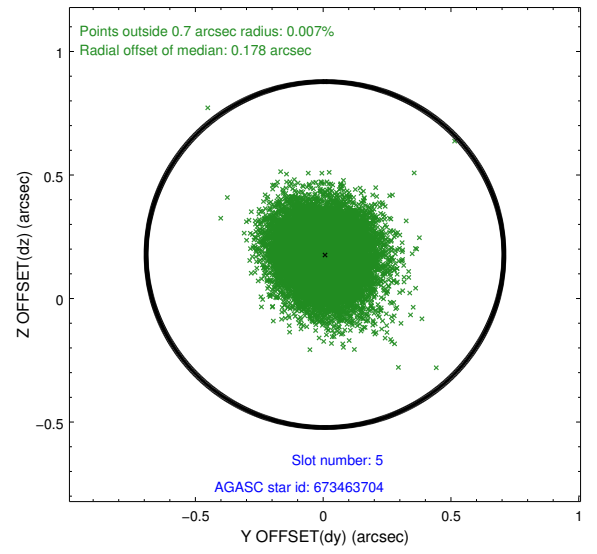
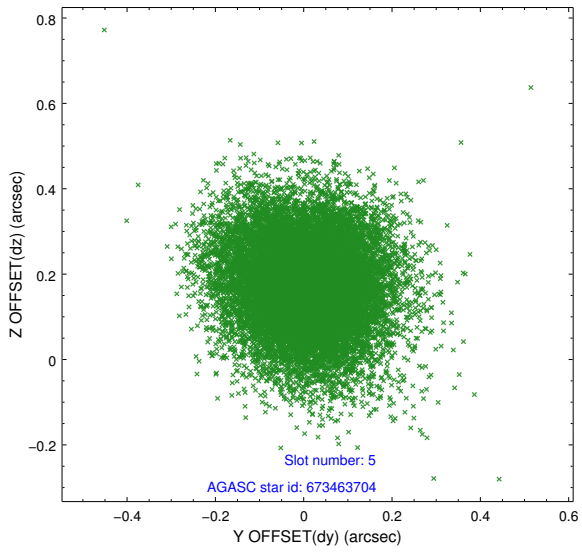
### 2.4.1 Slot 3



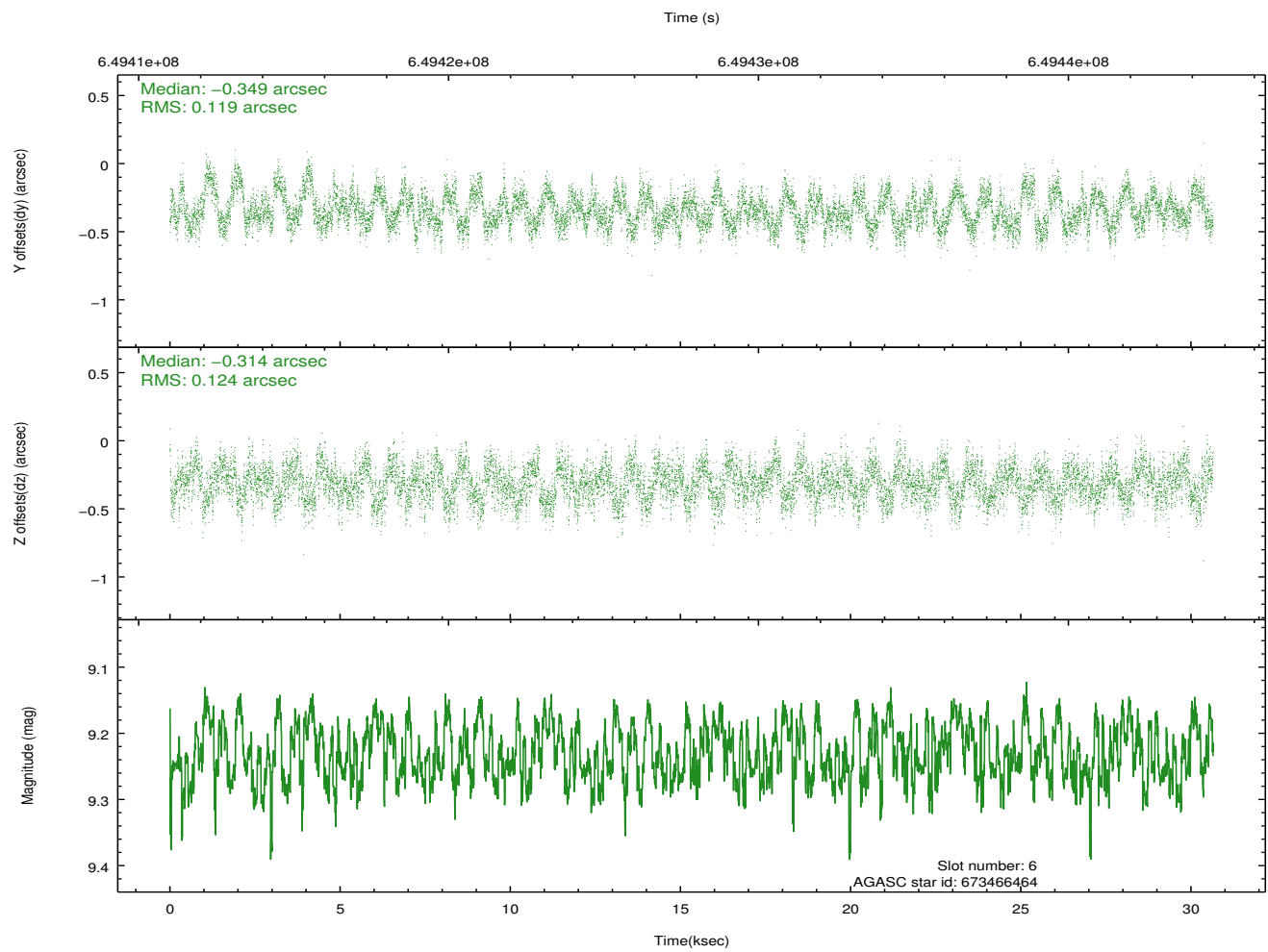
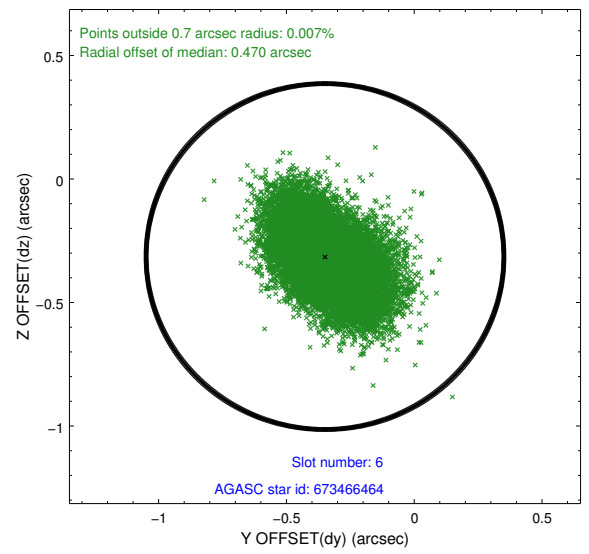
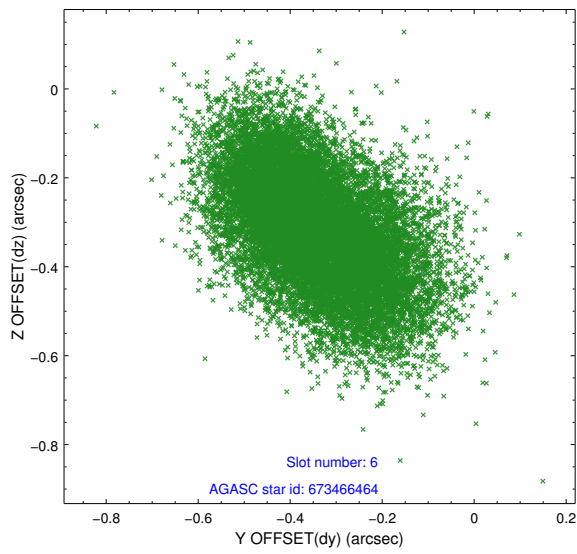
## 2.4.2 Slot 4



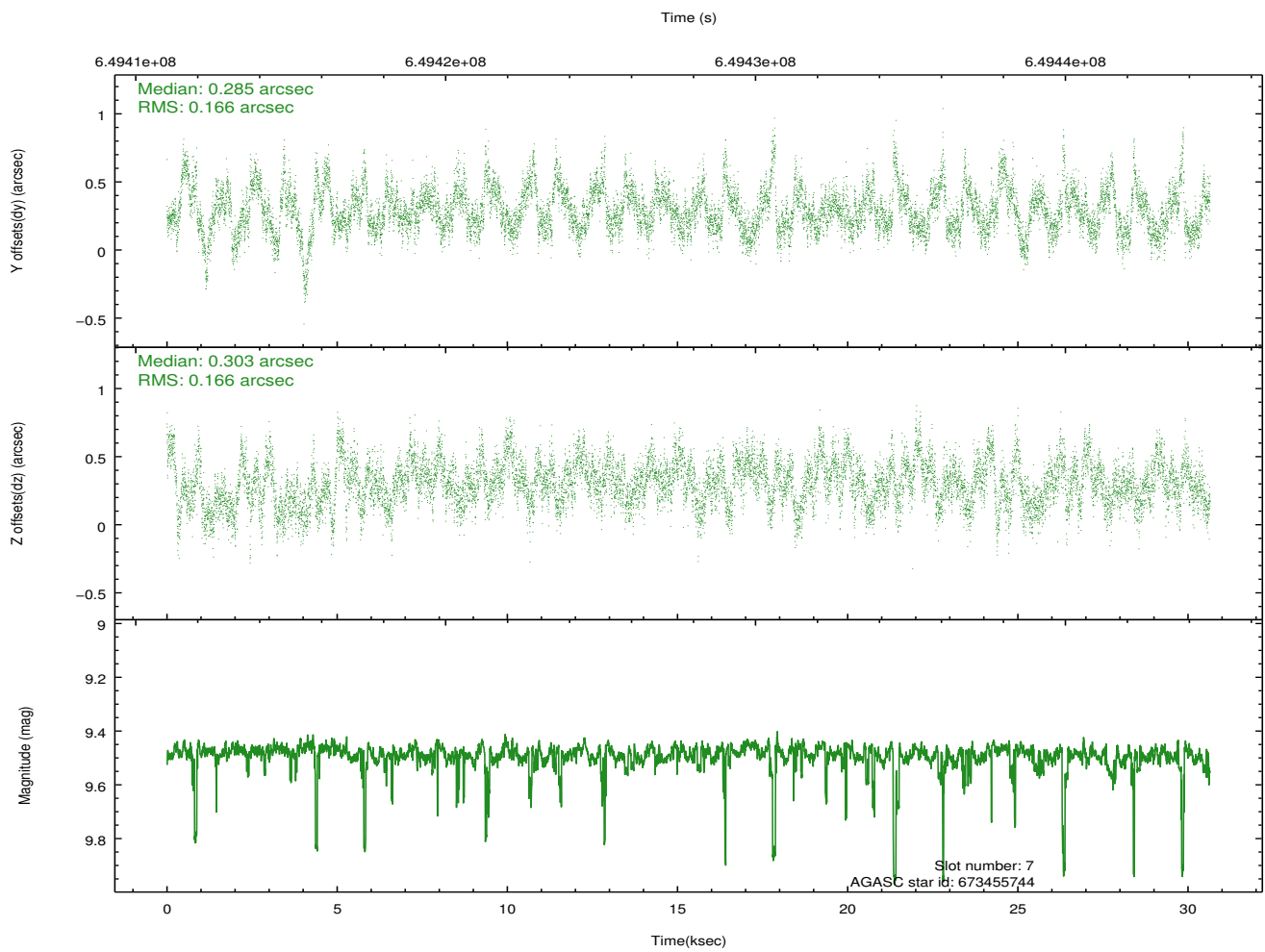
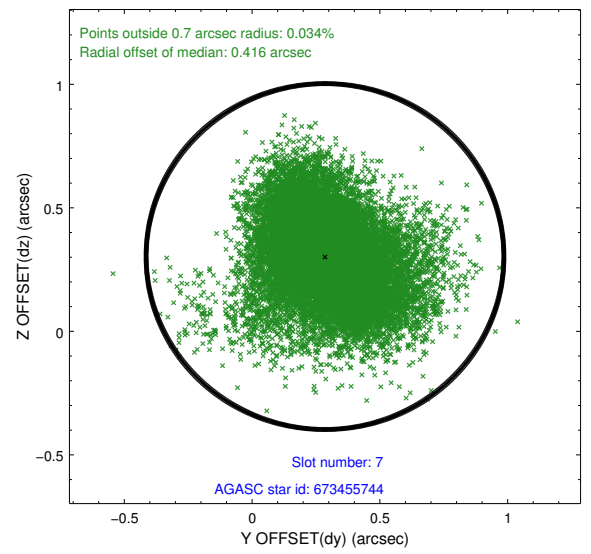
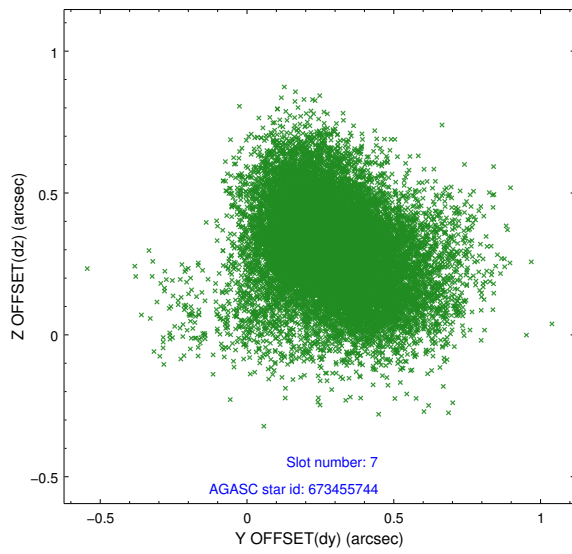
### 2.4.3 Slot 5



## 2.4.4 Slot 6

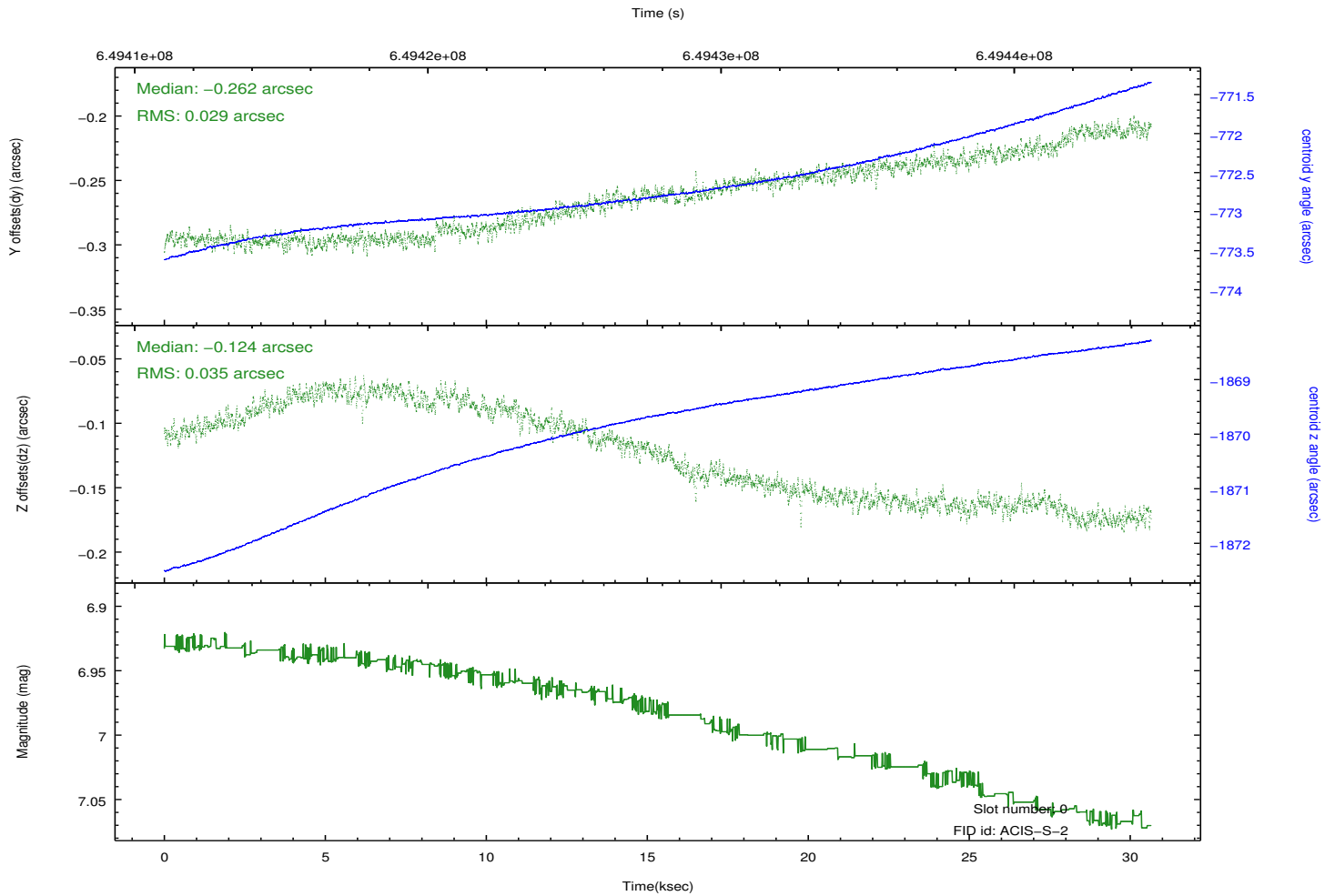
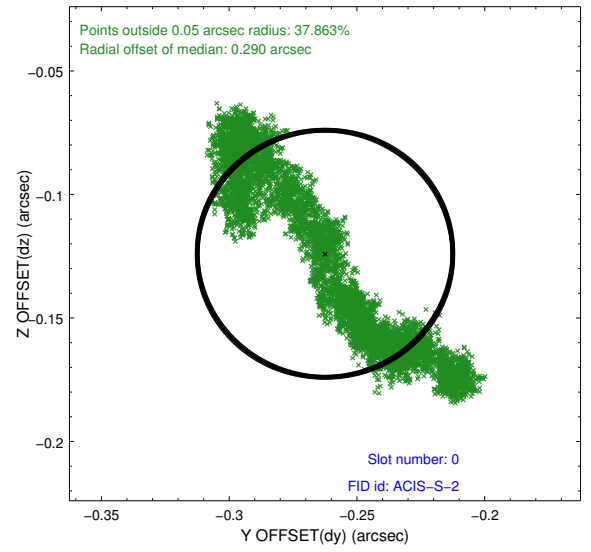
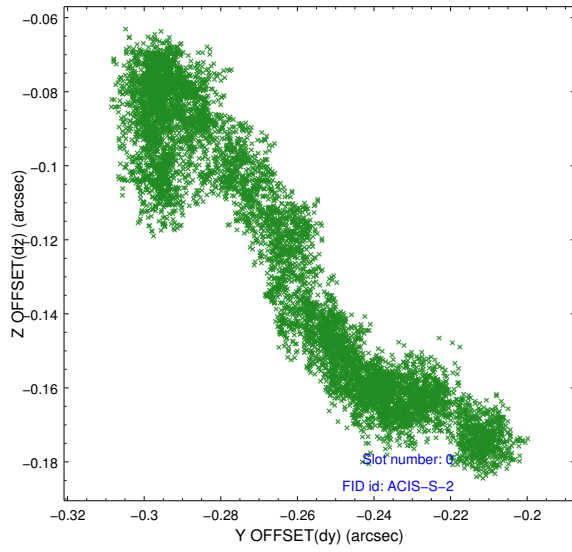


## 2.4.5 Slot 7

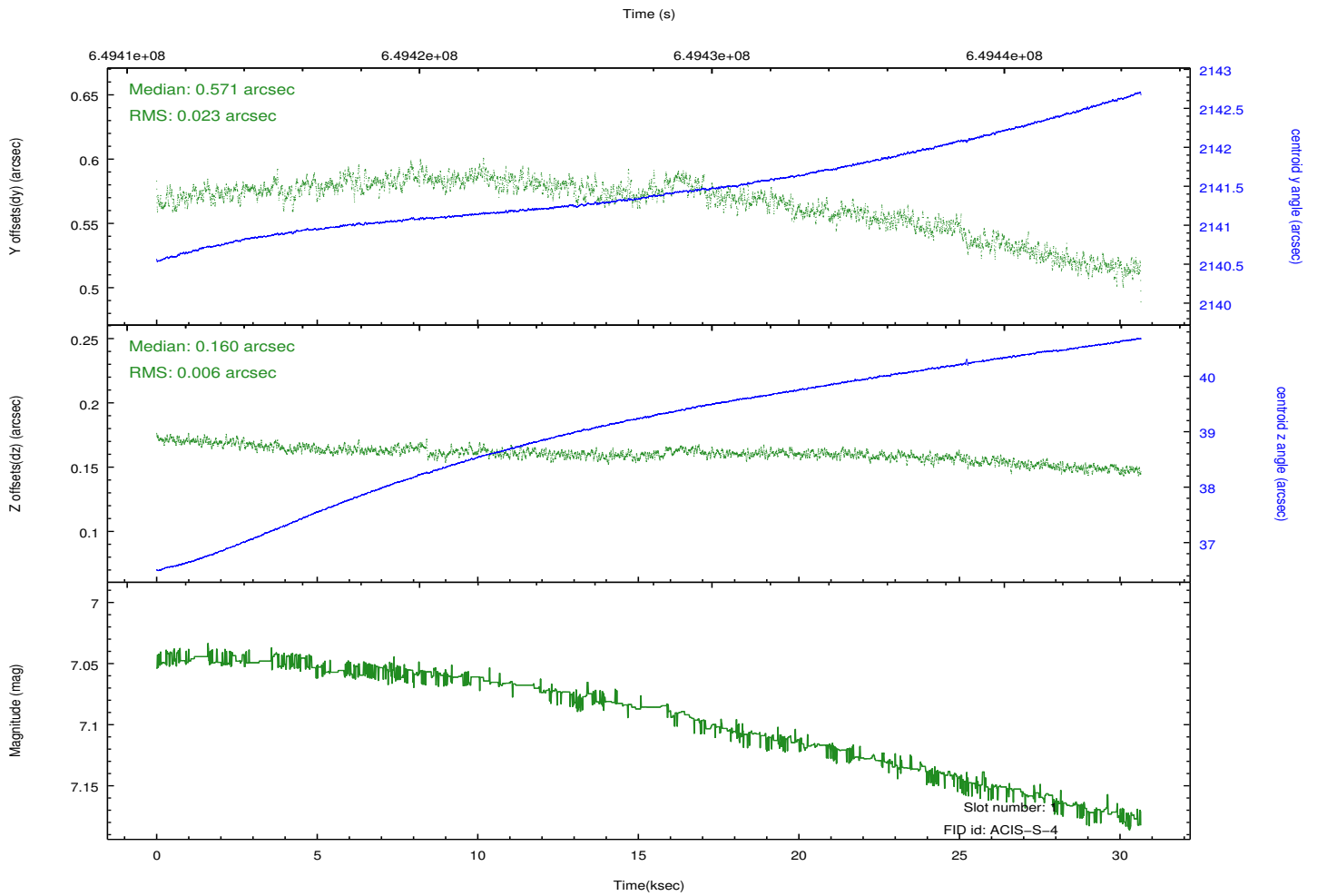
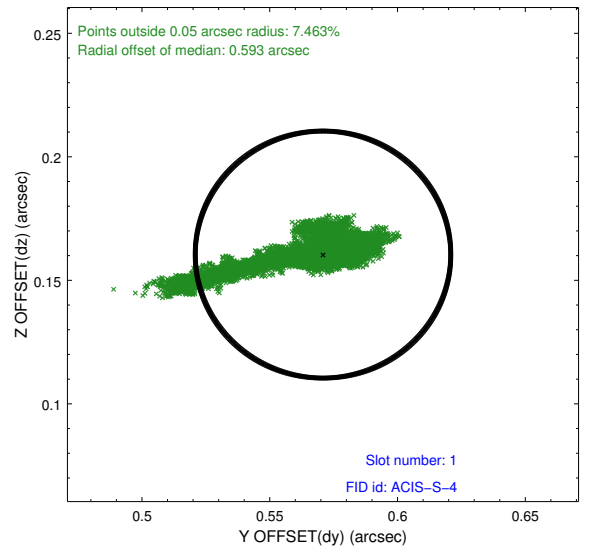
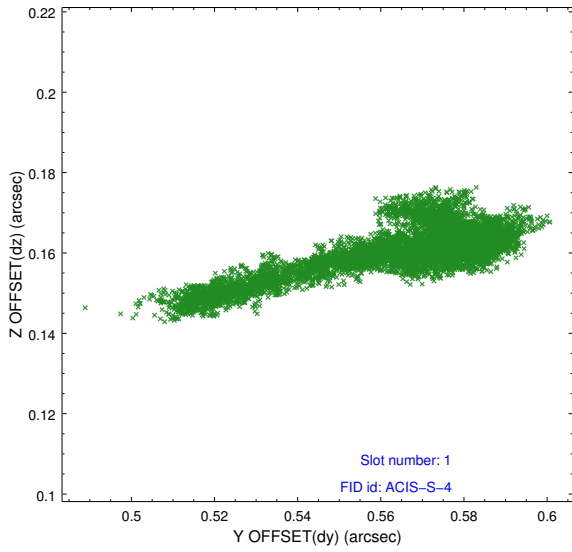


## 2.5 FID Slots

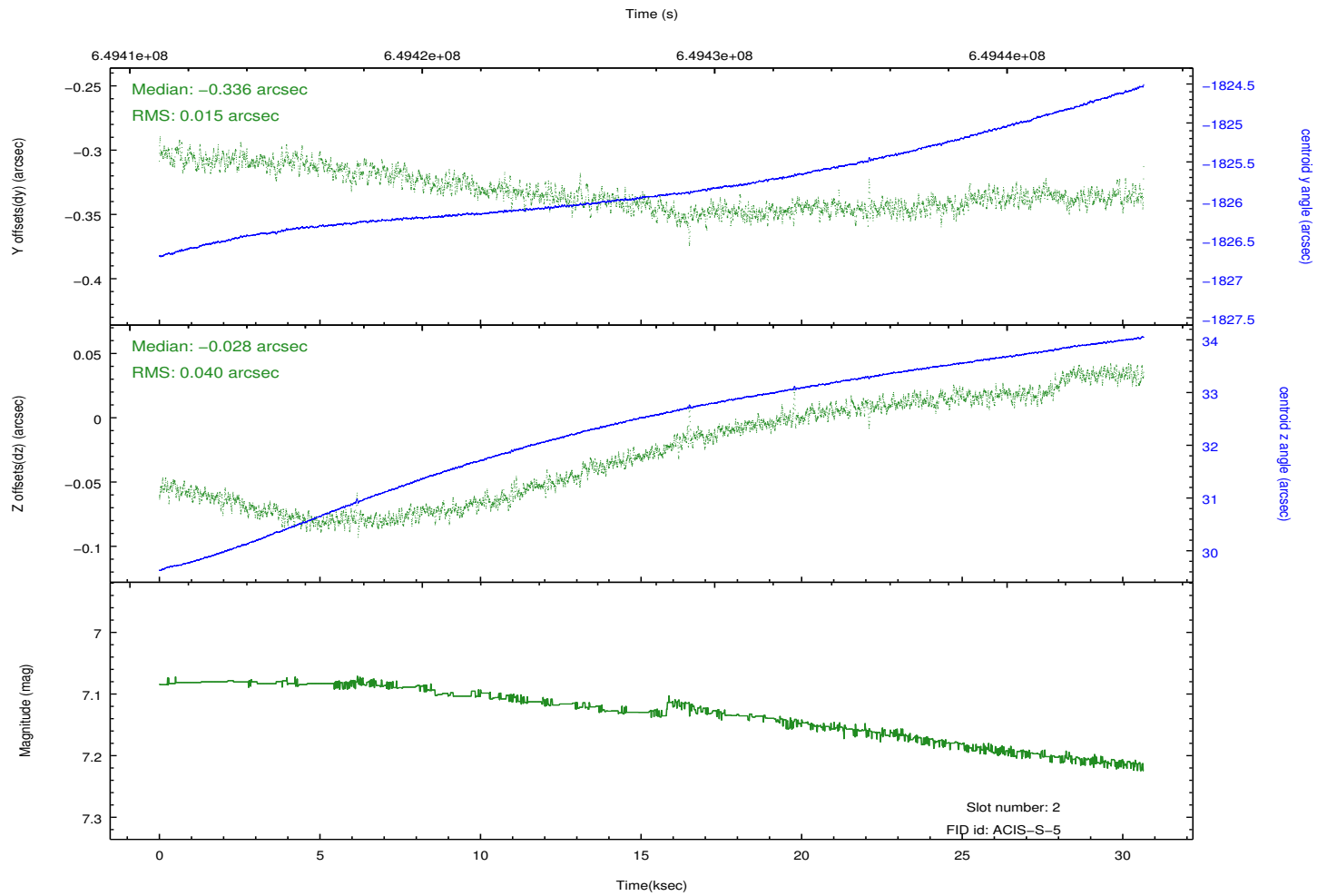
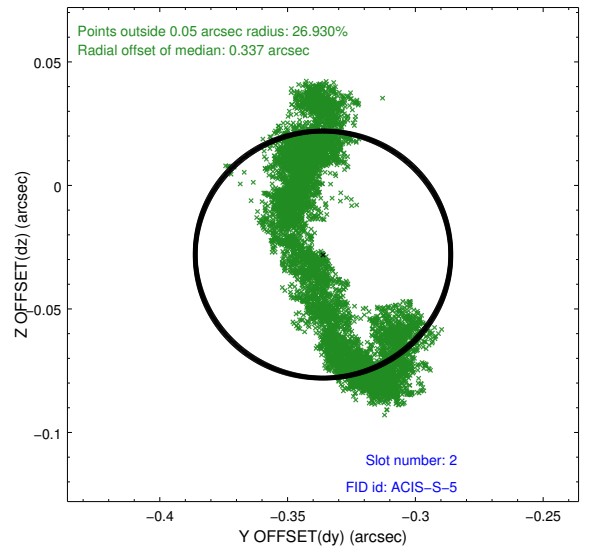
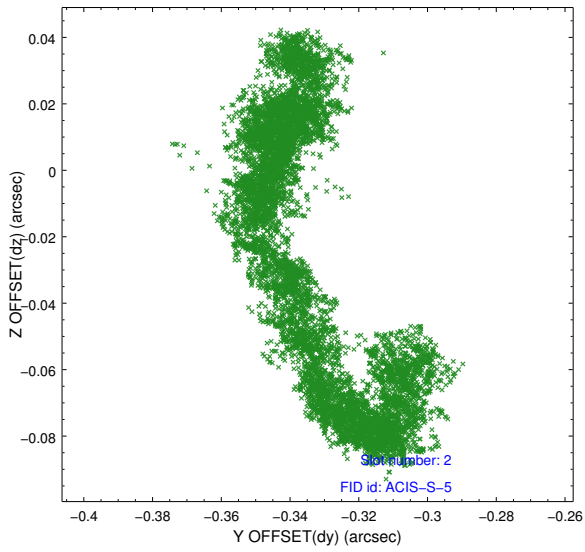
### 2.5.1 Slot 0



## 2.5.2 Slot 1

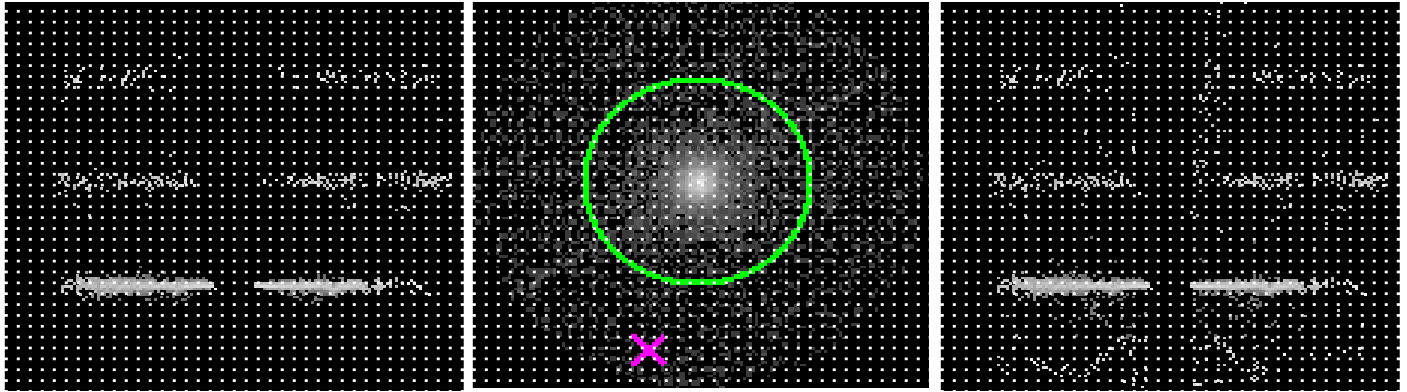


### 2.5.3 Slot 2



# 3 Gratings

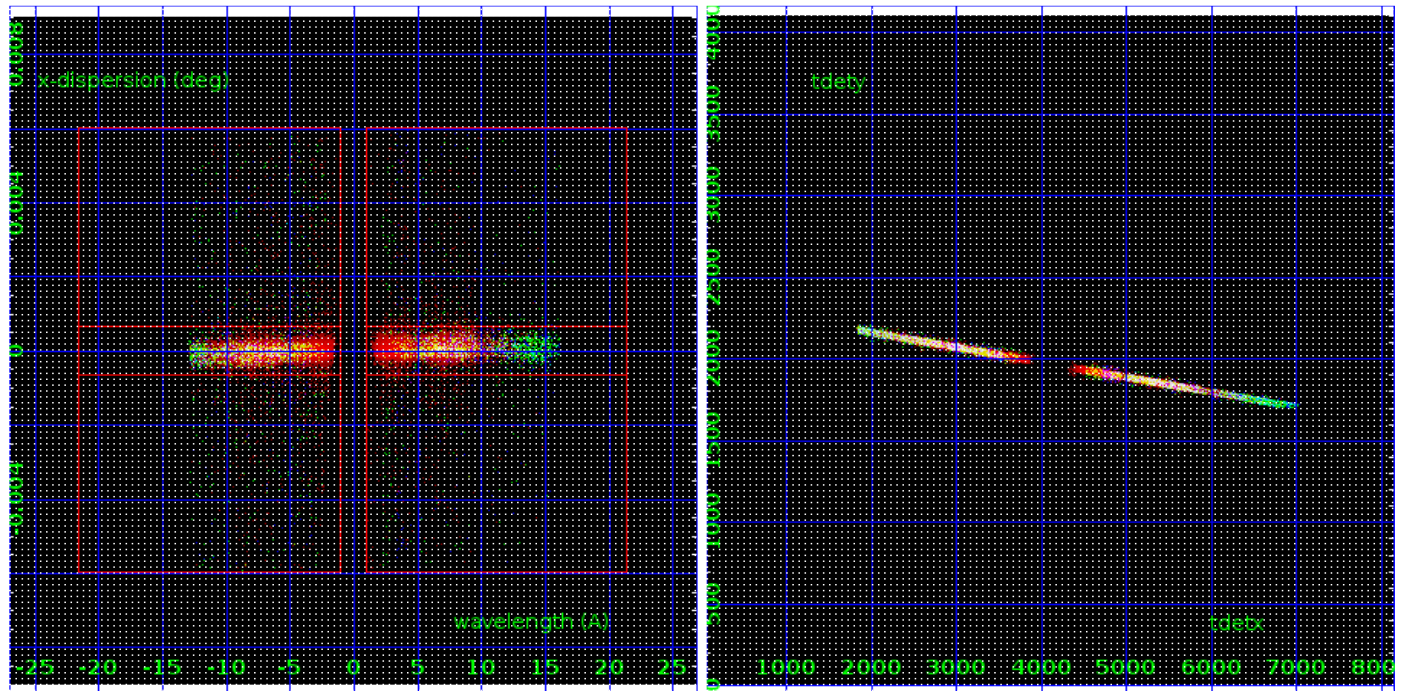
## 3.1 HEG Arm



HEG Order Sort 123

HEG Zero Order

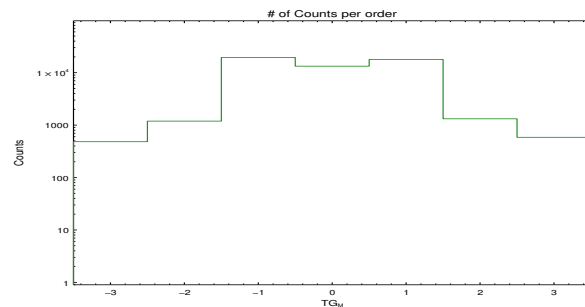
HEG Order Sort ALL

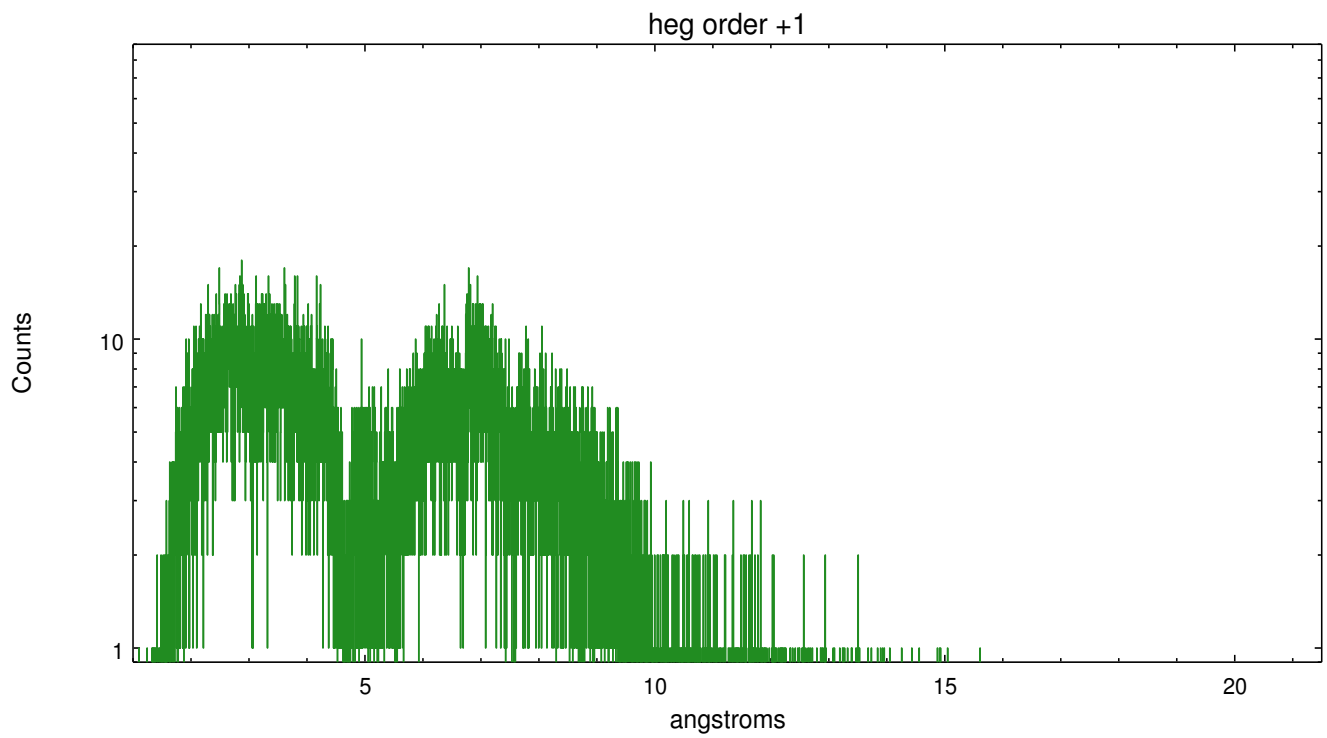
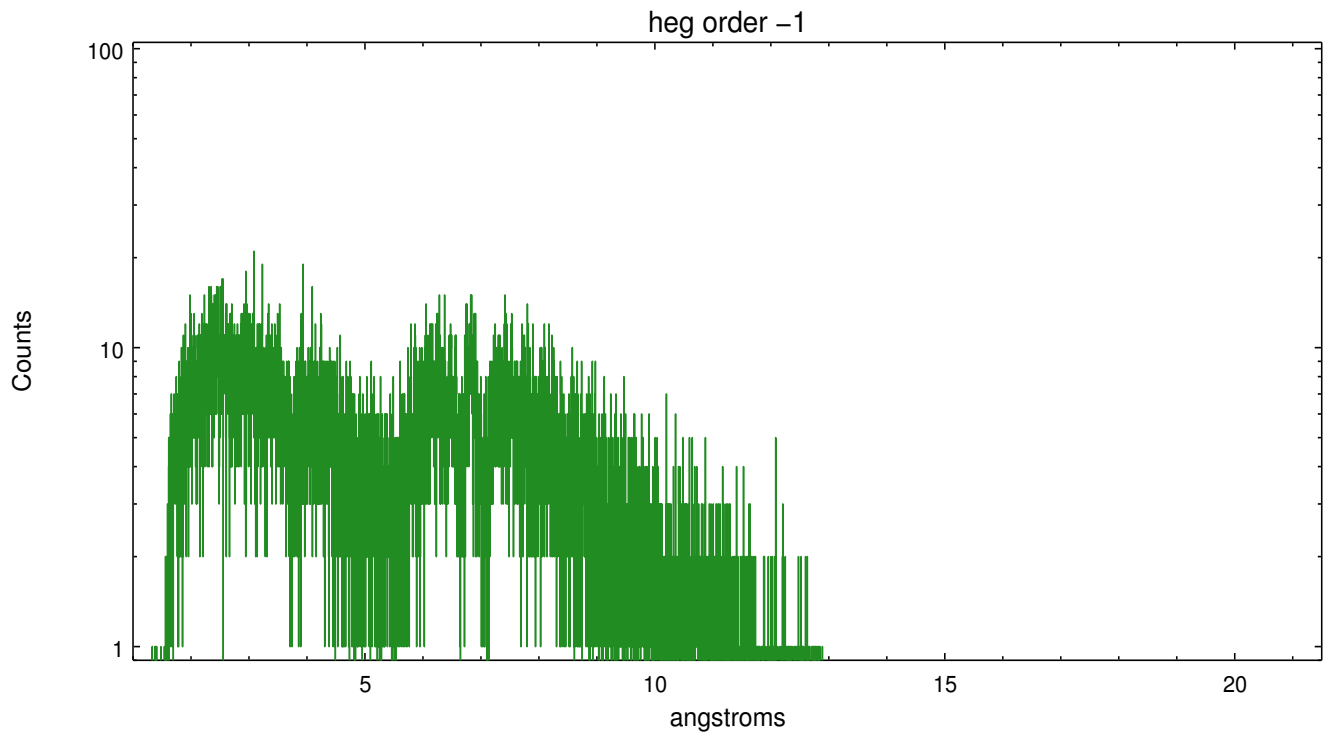


Spot Image HEG

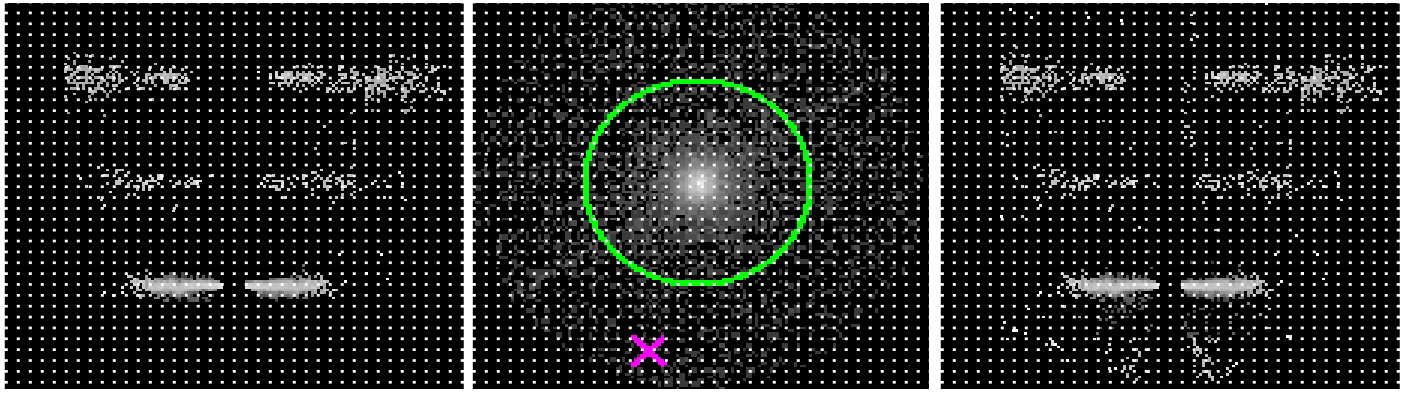
Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	483	1191	19536	13305	17837	1319	585





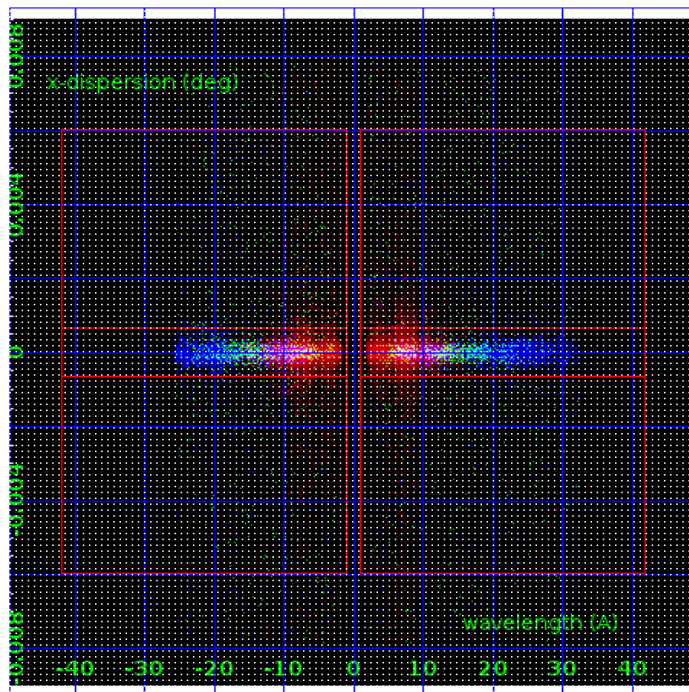
### 3.2 MEG Arm



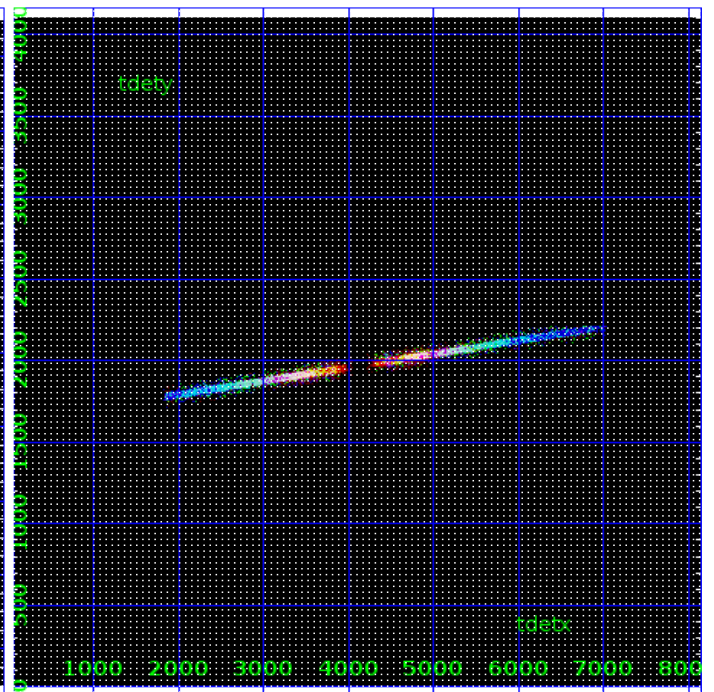
MEG Order Sort 123

MEG Zero Order

MEG Order Sort ALL

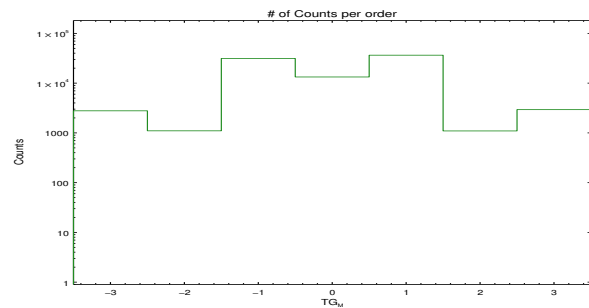


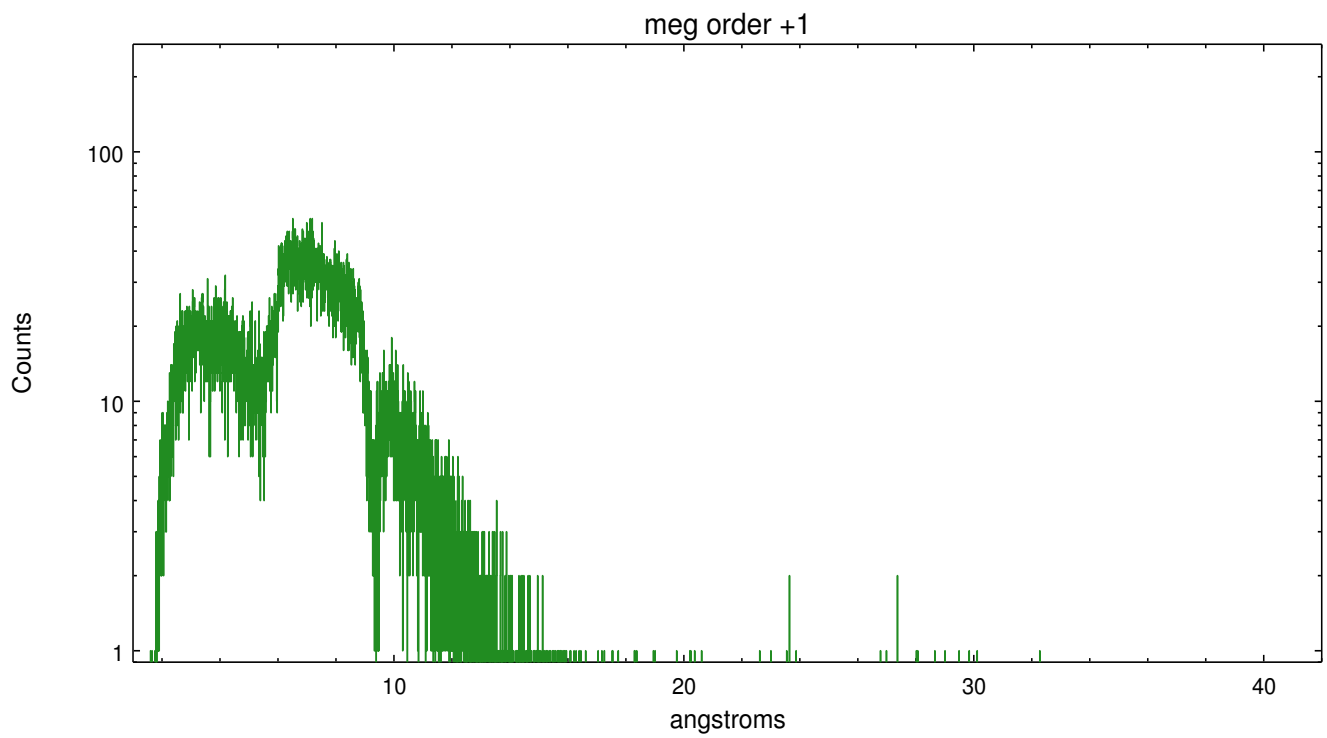
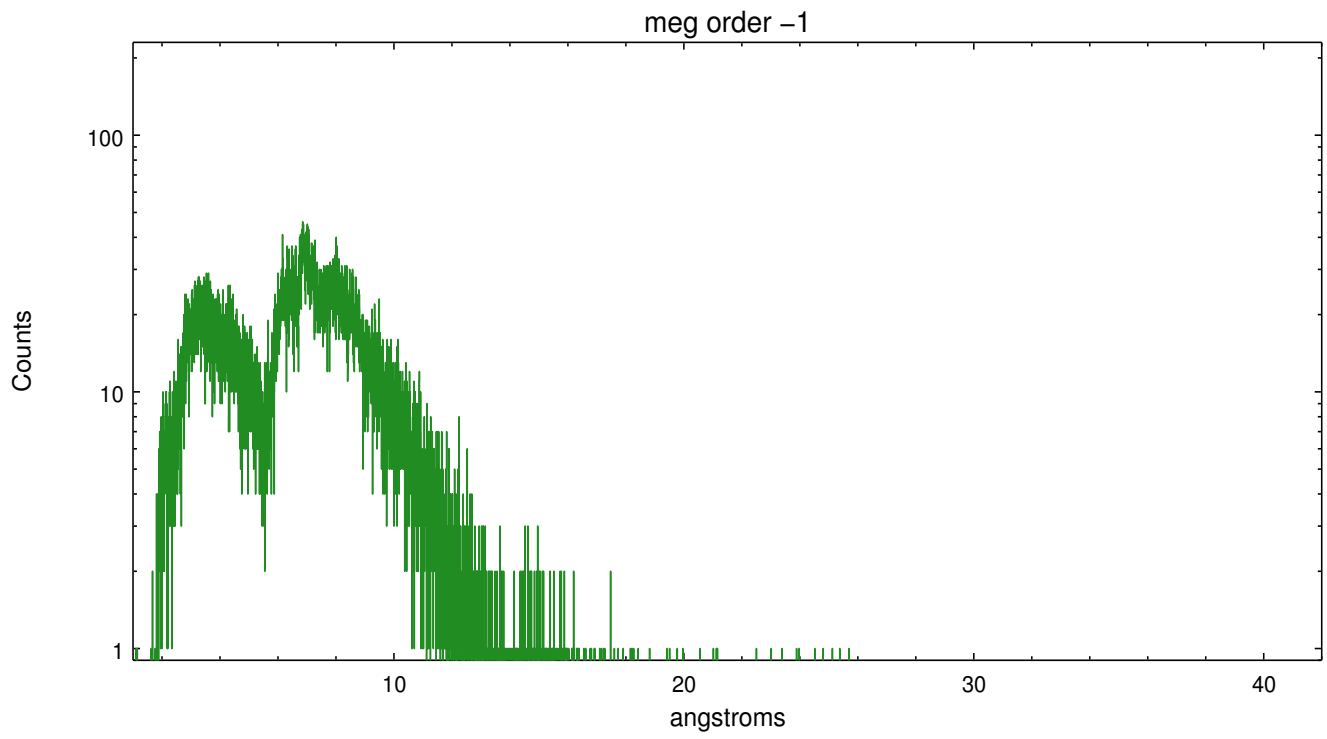
Spot Image MEG



Full Detector MEG

	order	order	order	order	order	order	order
	-3	-2	-1	0	1	2	3
Events	2780	1101	31342	13305	36436	1095	2936





# A Summary

## A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2018.08.01
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	30.586400857925

## A.2 Comments

Zeroth order piled up. The zeroth order sky position was determined using a software tool developed by CXC called findzero, which is available in CIAO as part of the tgdetect2 tool. The tool calculates the point of intersection of the readout streak on the ACIS CCD and the meg or leg dispersed spectral arm, rather than using a centroid position of the source. The findzero results are more accurate than source centroid in this case.