

# V&V Reference Report

## L2 ASCDS Version : 8.4.5

Observation 11963 - L2 Version 3  
Chandra X-Ray Center

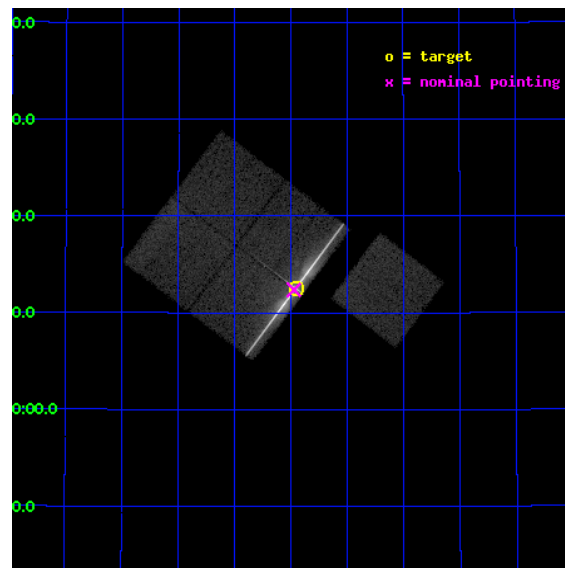
L2 Processing Date : Jul 20 2012

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# 1 Front

seq_num	790212	Sequence number
obs_id	11963	Observation id
title	AO-11 Calibration Observations of MKN 421	Proposal title
observer	Dr. CXC Calibration	Principal investigator
object	MKN421	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	166.113333	Observer's specified target RA [deg]
dec_targ	38.208806	Observer's specified target Dec [deg]
ra_nom	166.1182009288	Nominal RA [deg]
dec_nom	38.206407845252	Nominal Dec [deg]
roll_nom	127.00903736836	Nominal Roll [deg]
revision	3	Processing version of data
ontime	20177.900155187	Sum of GTIs [s]
livetime	19914.261034905	Livetime [s]
ontime0	20174.759174883	Sum of GTIs [s]
ontime1	20177.900155187	Sum of GTIs [s]
ontime2	20177.900155187	Sum of GTIs [s]
ontime3	20177.900155187	Sum of GTIs [s]
ontime6	20177.900155187	Sum of GTIs [s]
l2events	442733	Number of level 2 events

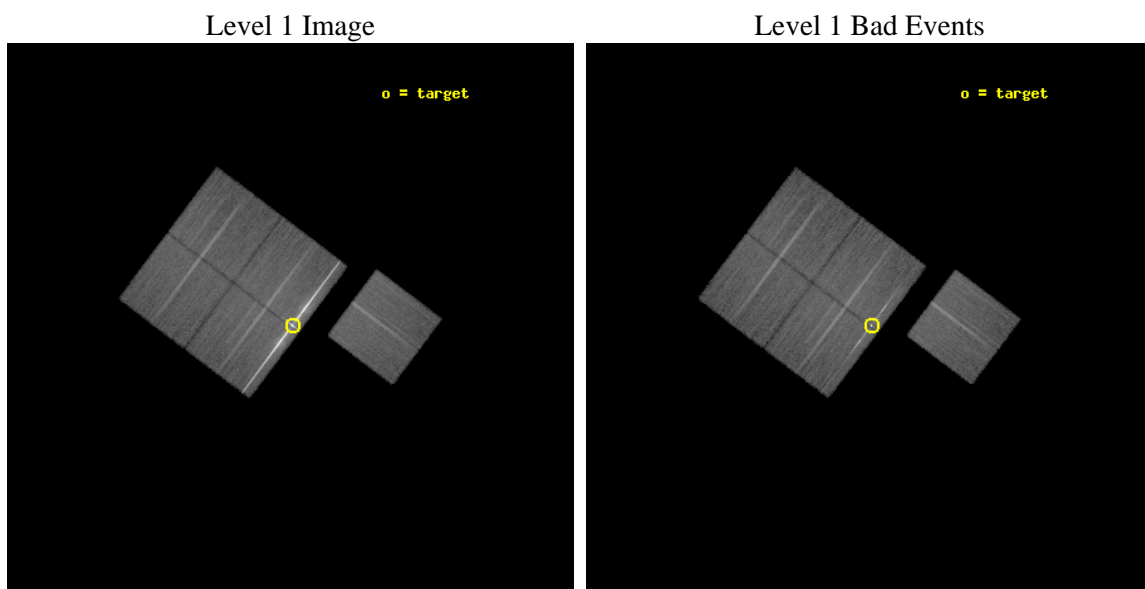




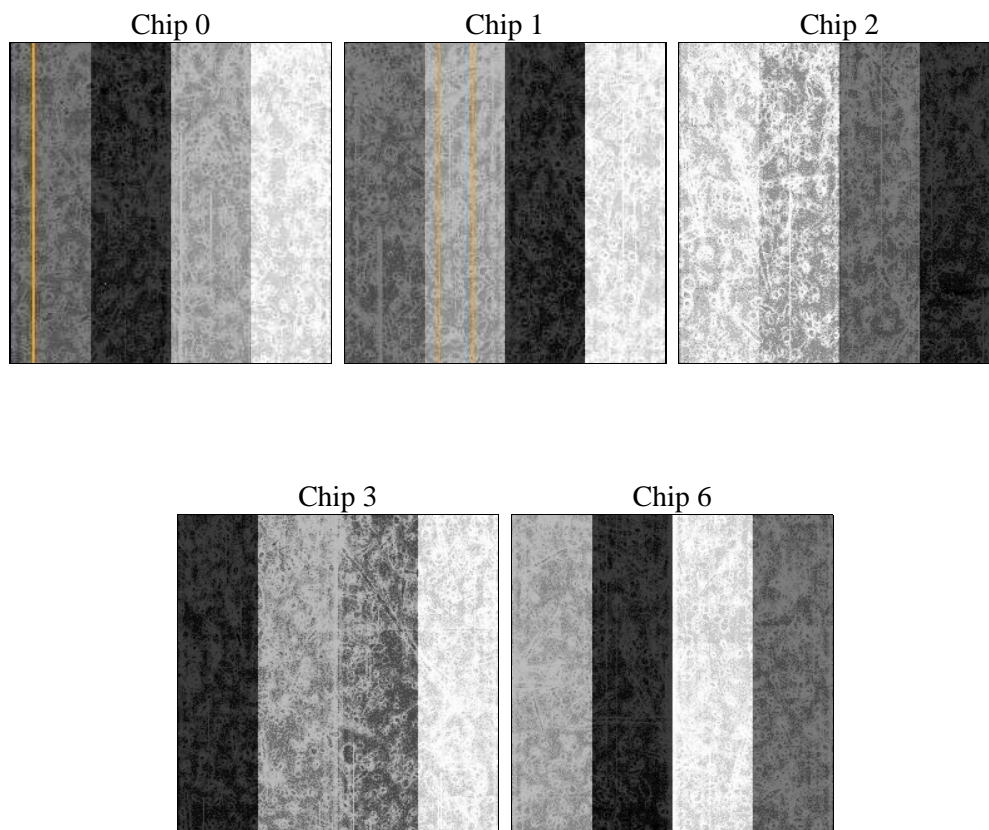
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	20000.000000	[s] Scheduled observation exposure time
ascdsver	8.4.5	Processing system revision	ontime	20177.900155187	Sum of GTIs [s]
caldbver	4.4.10	&#160	ontime0	20174.759174883	Sum of GTIs [s]
date	2012-06-21T00:58:50	Date and time of file creation	ontime1	20177.900155187	Sum of GTIs [s]
revision	2	Processing version of data	ontime2	20177.900155187	Sum of GTIs [s]
			ontime3	20177.900155187	Sum of GTIs [s]
			ontime6	20177.900155187	Sum of GTIs [s]
			l1events	1288357	Number of level 1 events

### 2.1.4 Events

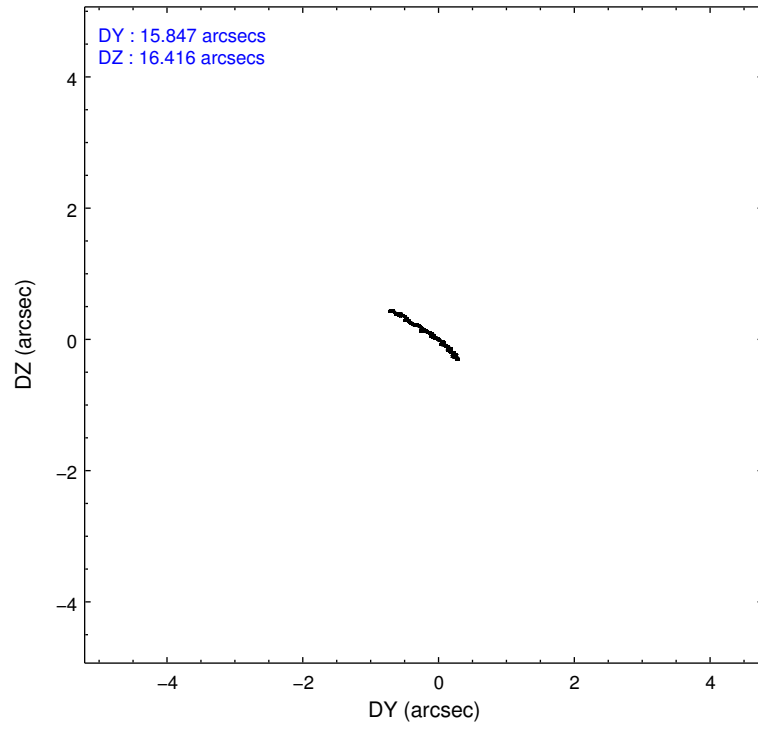
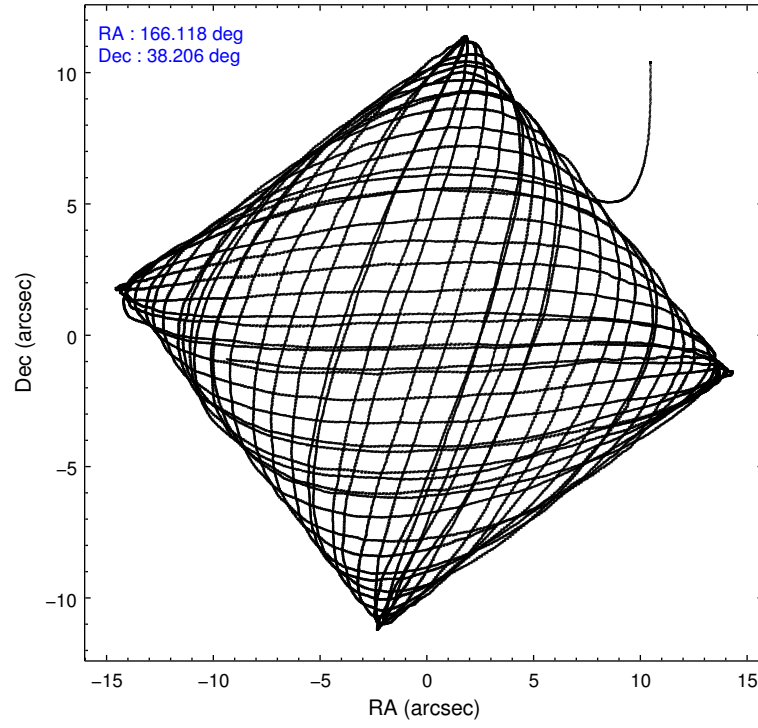
	ccd 0	ccd 1	ccd 2	ccd 3	ccd 6
level 1 events	164744	166390	409166	368412	179645
rejected events	146715	146309	184754	171486	160951
rejected %	89%	87%	45%	46%	89%

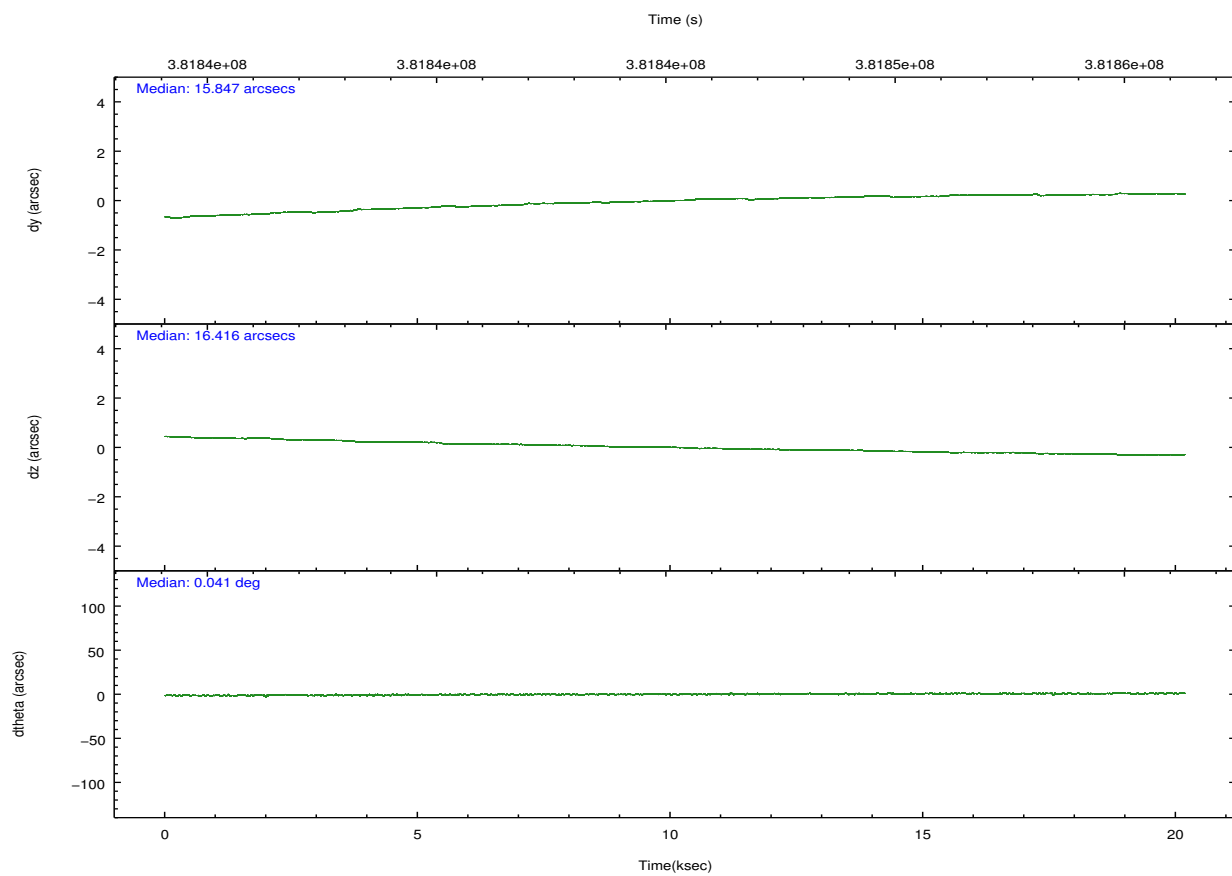
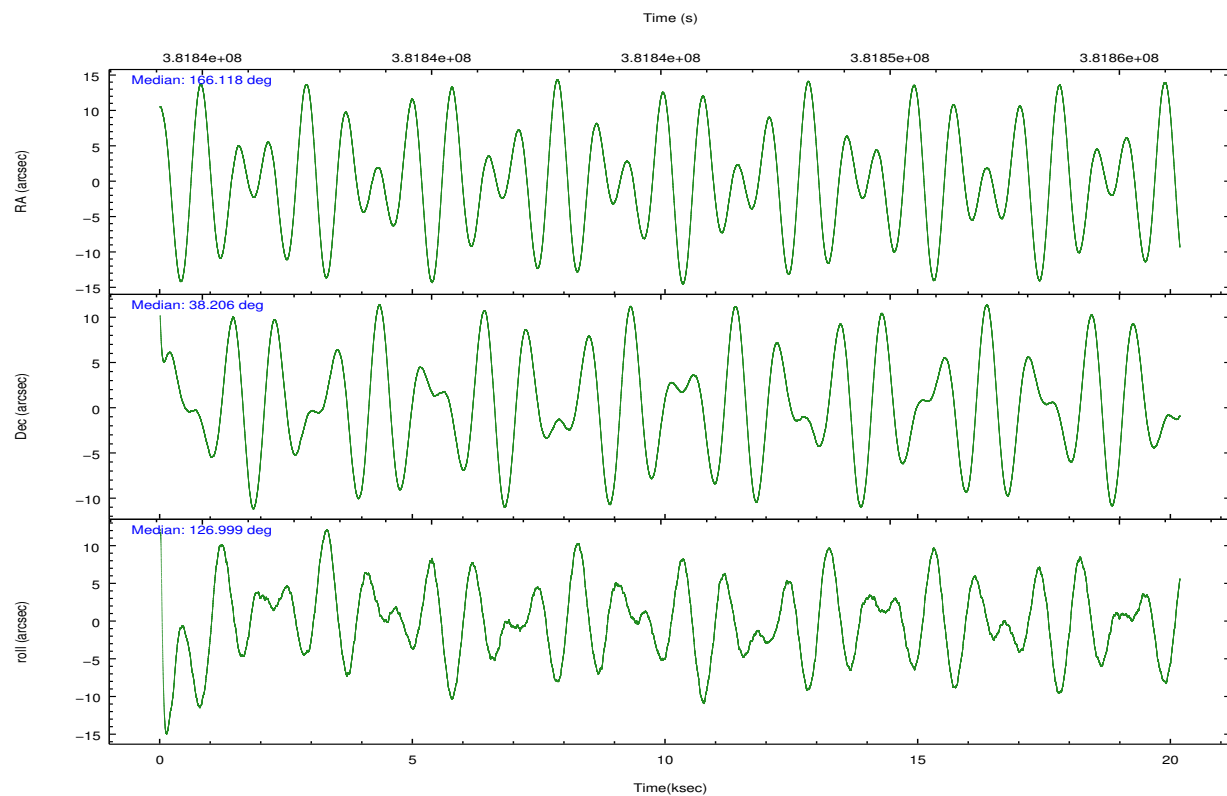
	ccd 0	ccd 1	ccd 2	ccd 3	ccd 6
grade 0 events	6523	7540	171067	151240	7056
	3%	4%	41%	41%	3%
grade 1 events	94	87	5173	3248	89
	0%	0%	1%	0%	0%
grade 2 events	4649	4881	26512	23830	4356
	2%	2%	6%	6%	2%
grade 3 events	2180	2229	9580	8156	2135
	1%	1%	2%	2%	1%
grade 4 events	1994	2186	9366	8429	2018
	1%	1%	2%	2%	1%
grade 5 events	6834	7586	10394	9598	7471
	4%	4%	2%	2%	4%
grade 6 events	3656	4416	10409	8660	4135
	2%	2%	2%	2%	2%
grade 7 events	138814	137465	166665	155251	152385
	84%	82%	40%	42%	84%

## 2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-01236	ACIS-01236	Obspar file type	PREDICTED	ACTUAL
Grating	LETG	LETG	Obspar update status	NONE	UPDATED
Data mode	FAINT	FAINT	Number of optional ACIS chips dropped	0	0
Observation mode	POINTING	POINTING	On-chip summing requested	N	N
[deg] Pointing RA	166.150398	166.1182009288046	Subarray requested	NONE	NONE
[deg] Pointing Dec	38.196056	38.20640784525234	Alternating exposures requested	N	N
[deg] Pointing Roll	126.832478	127.0090373683568	[s] Primary exposure time	0.000000	3.1
[s] Window start time (MET)	378691266.184000	378691266.184000			
[s] Window stop time (MET)	383702466.184000	383702466.184000			
[mm] SIM focus pos	-0.782348	-0.7809083437167272			
[mm] SIM defocus	0	0.001439871863259334			
[mm] SIM translation stage pos	-213.592463	-213.5935991828236			
[mm] SIM translation stage offset	-20	-19.99885382010612			
[s] Observation start time (MET)	381835294.184000	381833738.65825			
Observation start date	2010-02-06T09:20:28	2010-02-06T08:55:38			
[s] Observation end time (MET)	381855294.184000	381855428.17185			
Observation end date	2010-02-06T14:53:48	2010-02-06T14:57:08			
Read mode	TIMED	TIMED			

## 2.3 Aspect



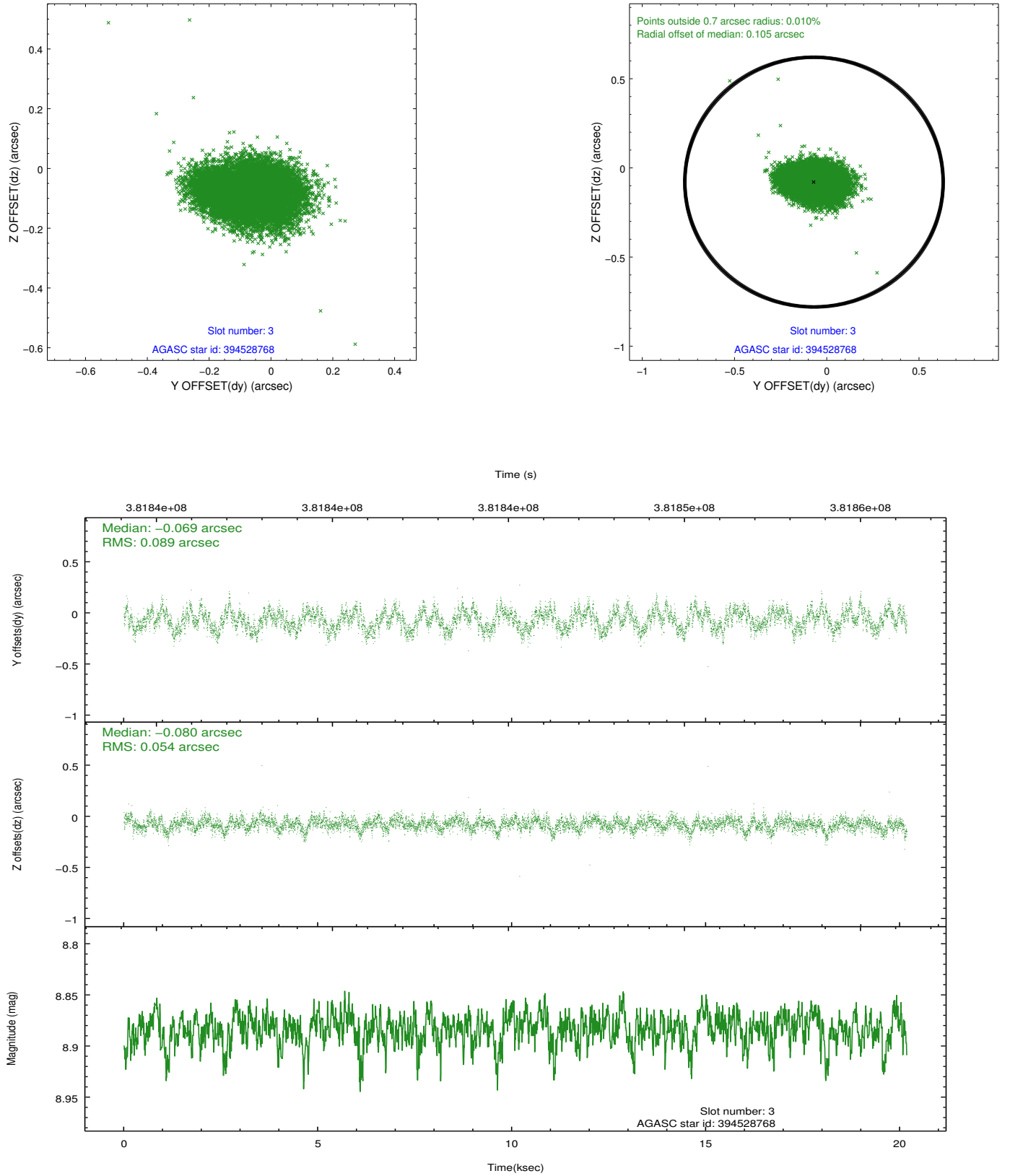


### Slot Statistics

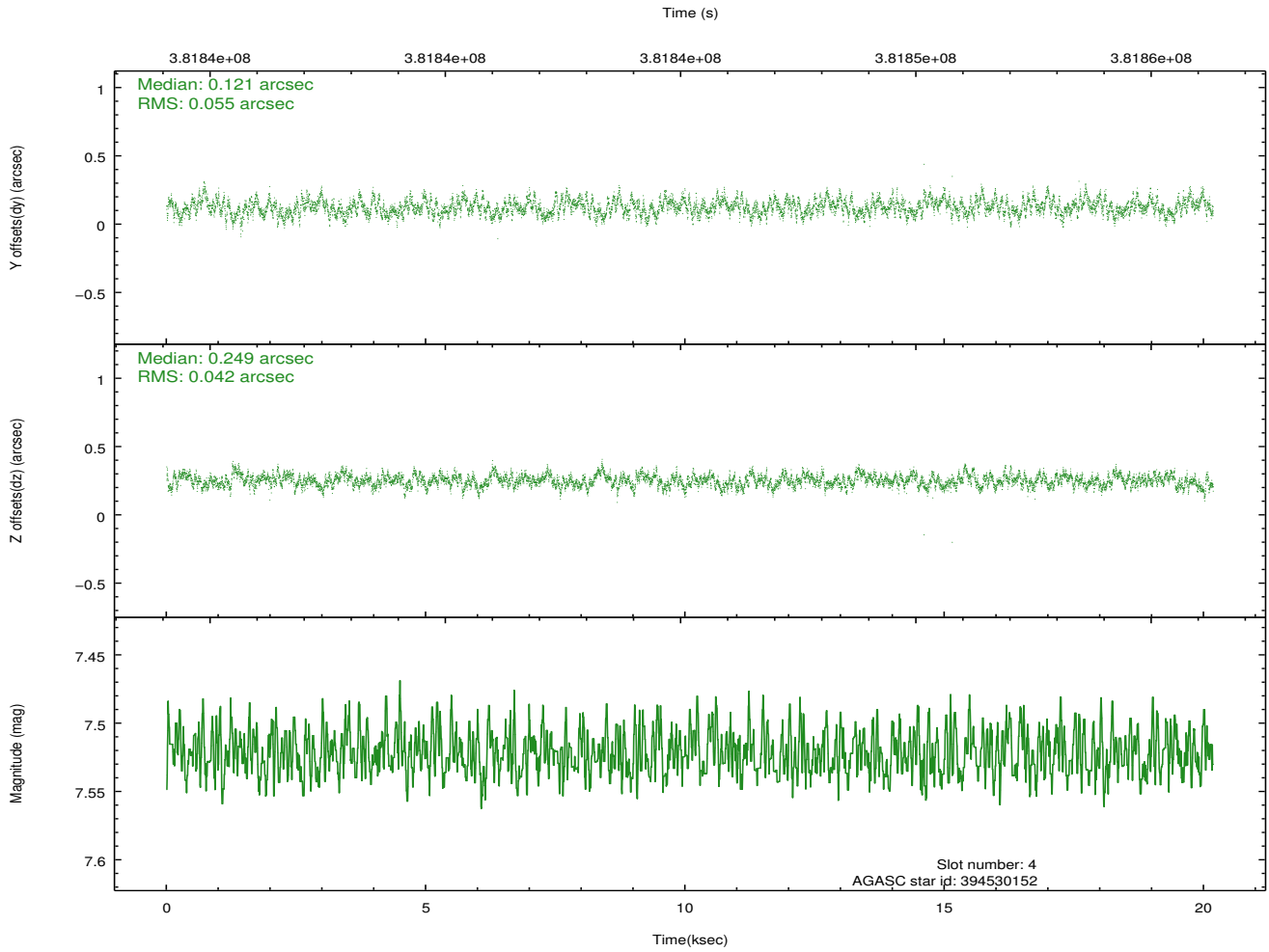
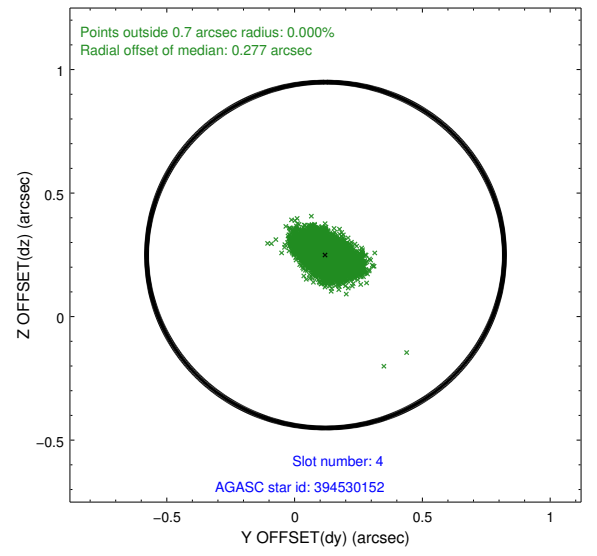
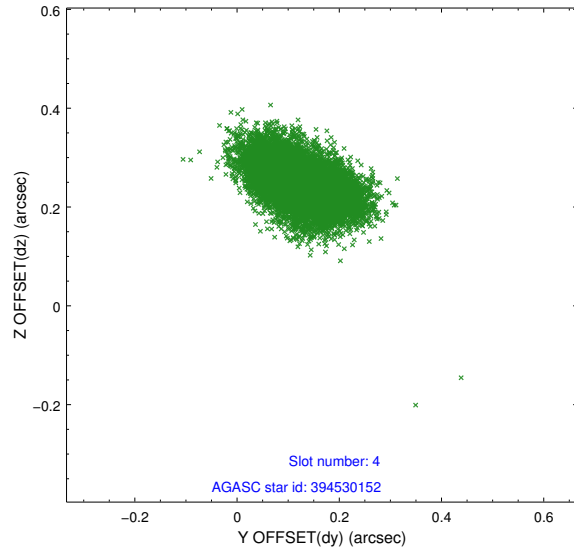
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-I-1	6.98	4922	0.284	-0.242	0.010	0.018	0.000000	0.000000	925.22	-1250.25
1	FID	ACIS-I-5	6.99	4921	-0.453	0.150	0.019	0.030	0.000000	0.000000	-1823.50	647.47
2	FID	ACIS-I-6	7.05	4921	0.149	0.104	0.012	0.025	0.000000	0.000000	390.45	1292.13
3	GUIDE	394528768	8.88	9809	-0.069	-0.080	0.111	0.176	166.180365	38.952248	2128.96	-1698.55
4	GUIDE	394530152	7.52	9842	0.121	0.249	0.073	0.121	166.075805	38.868252	2063.00	-1282.83
5	GUIDE	394533744	8.90	9835	-0.306	-0.147	0.099	0.162	167.094985	37.988717	-2192.84	-1706.36
6	GUIDE	394533848	8.75	9834	0.096	0.002	0.082	0.135	166.382906	38.276007	-160.24	-696.68
7	GUIDE	394543960	9.78	9823	0.138	-0.020	0.216	0.330	165.802757	37.787371	-583.24	1672.47

## 2.4 Star Slots

### 2.4.1 Slot 3

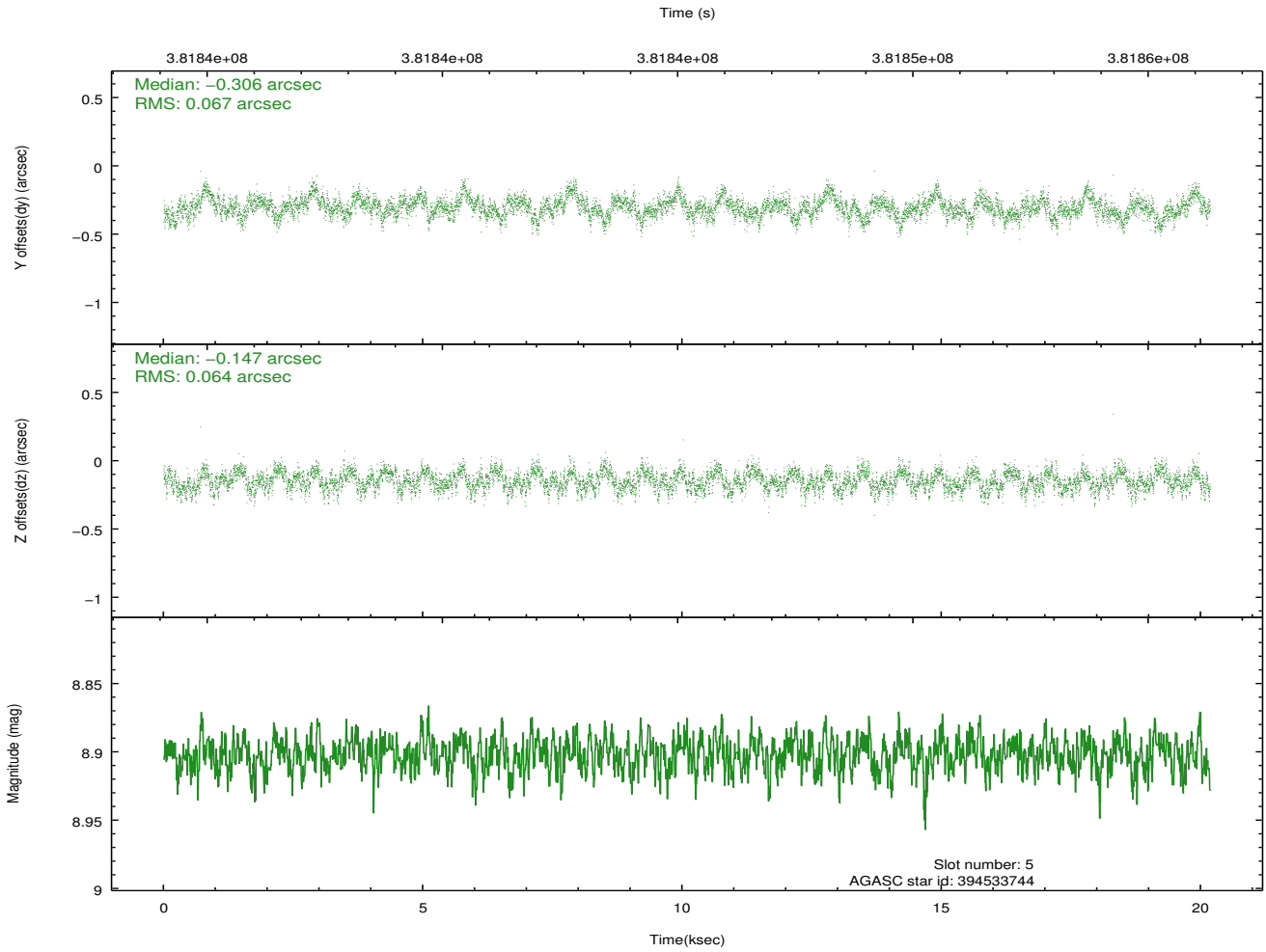
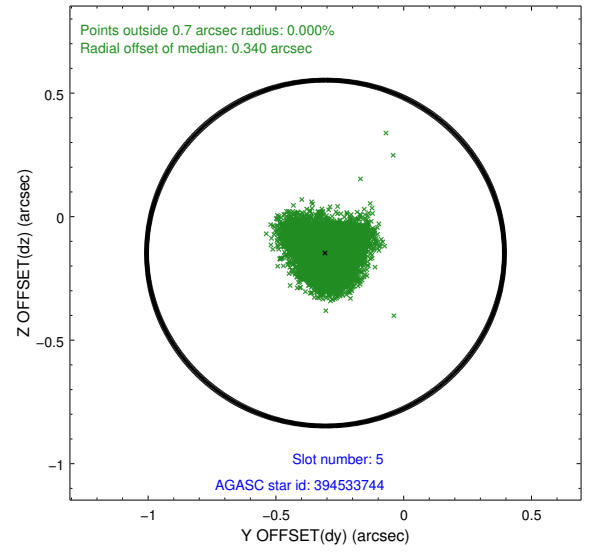
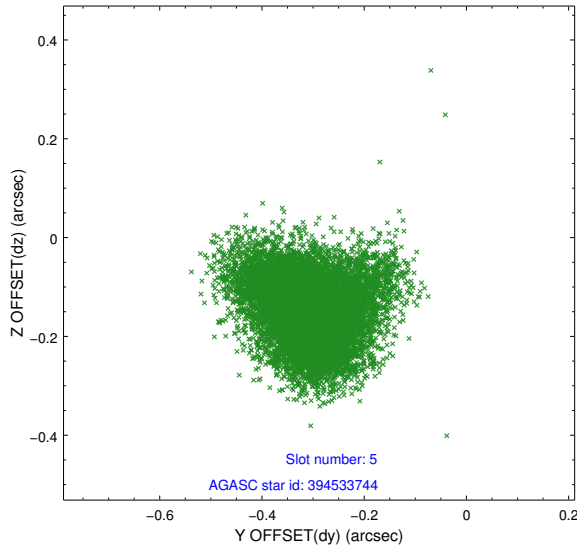


## 2.4.2 Slot 4

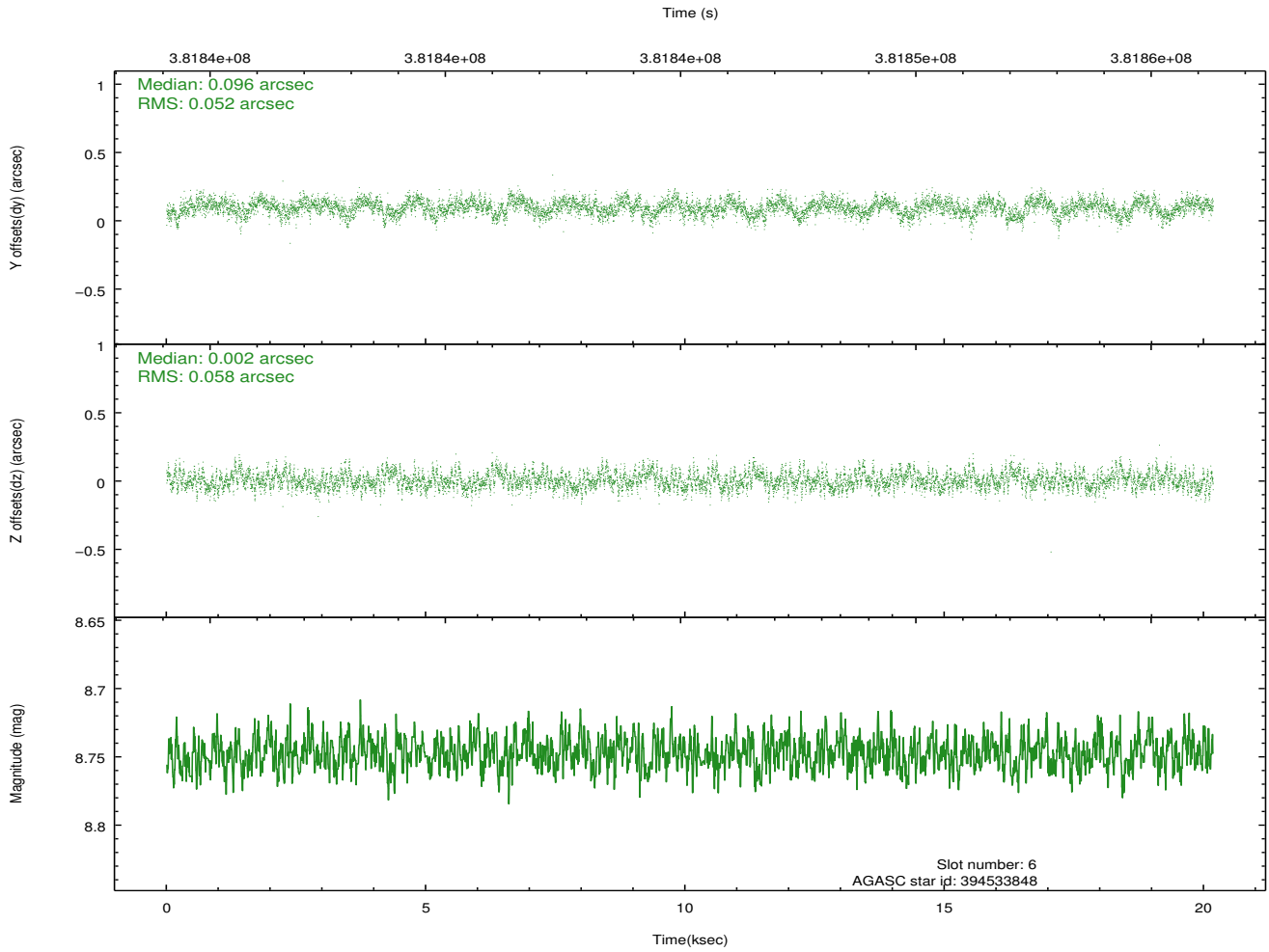
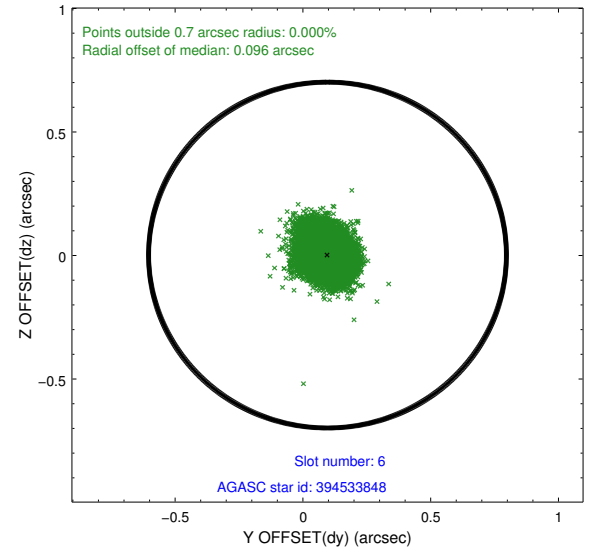
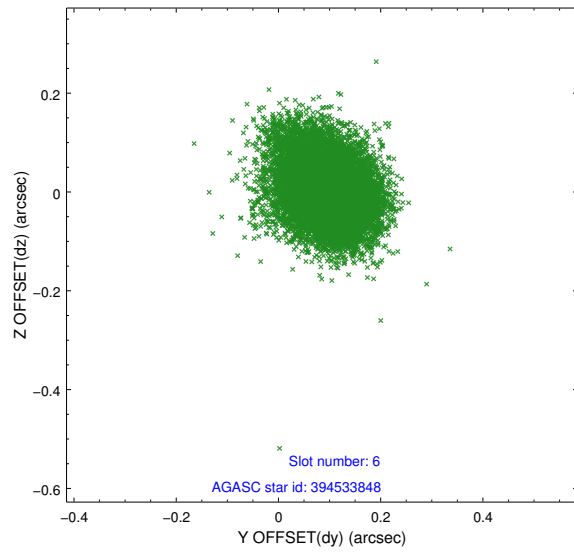




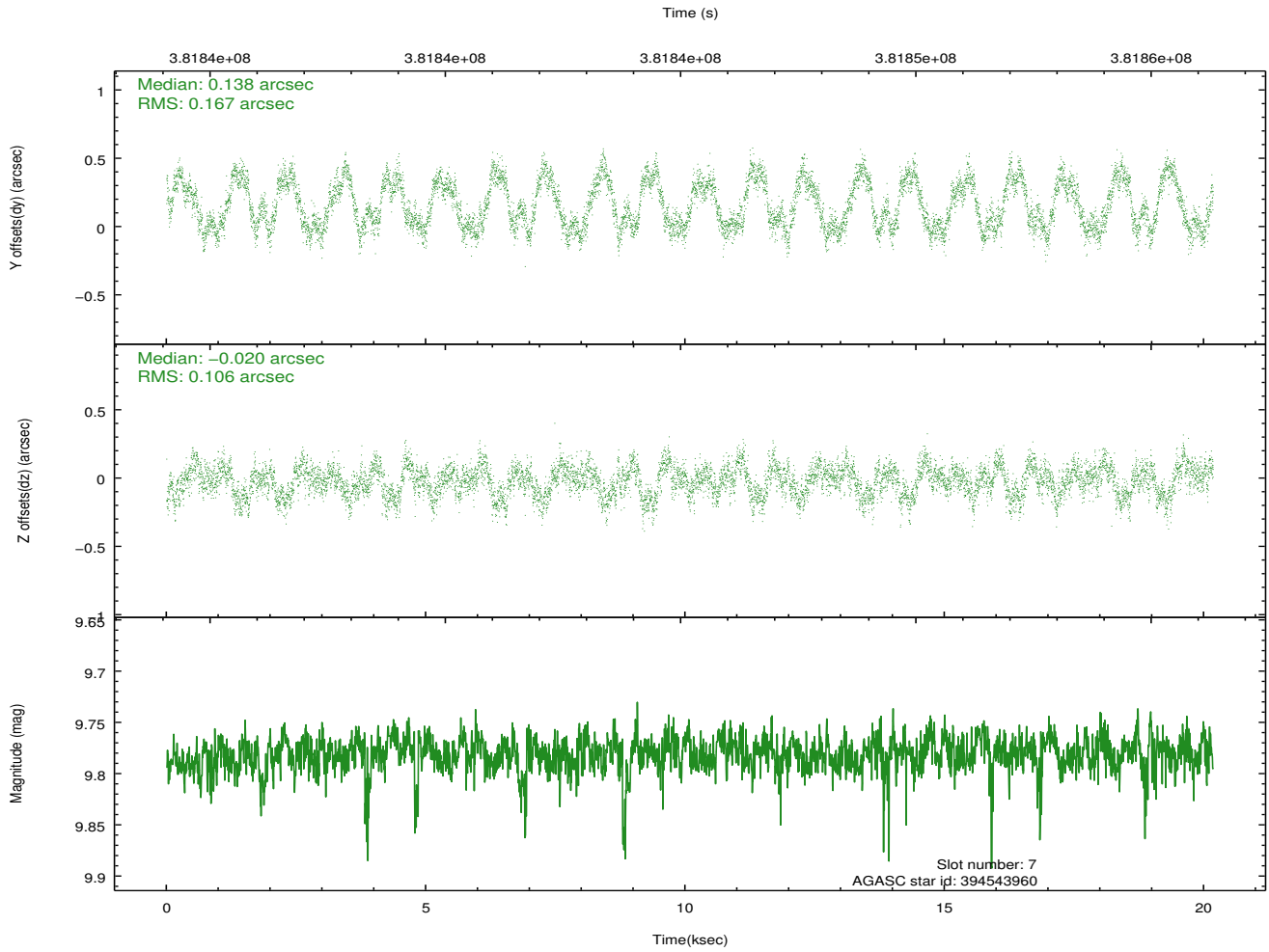
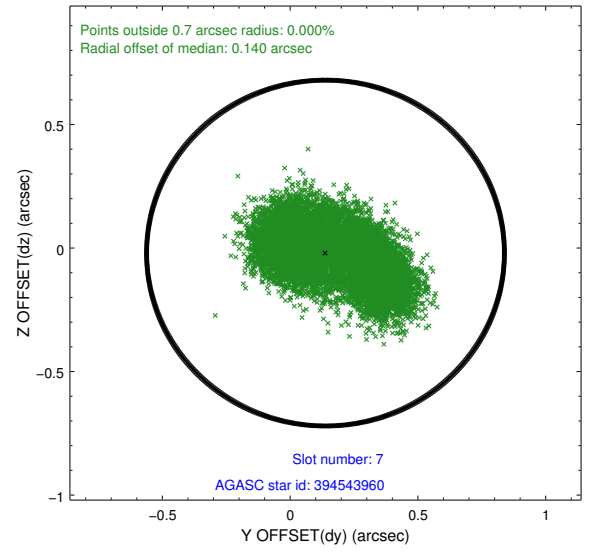
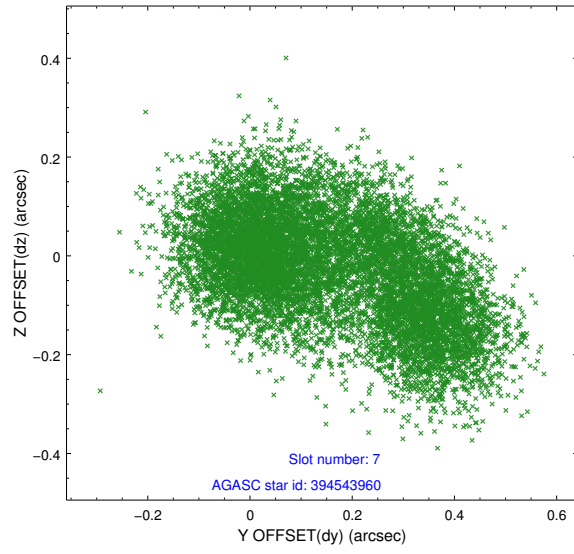
### 2.4.3 Slot 5



## 2.4.4 Slot 6

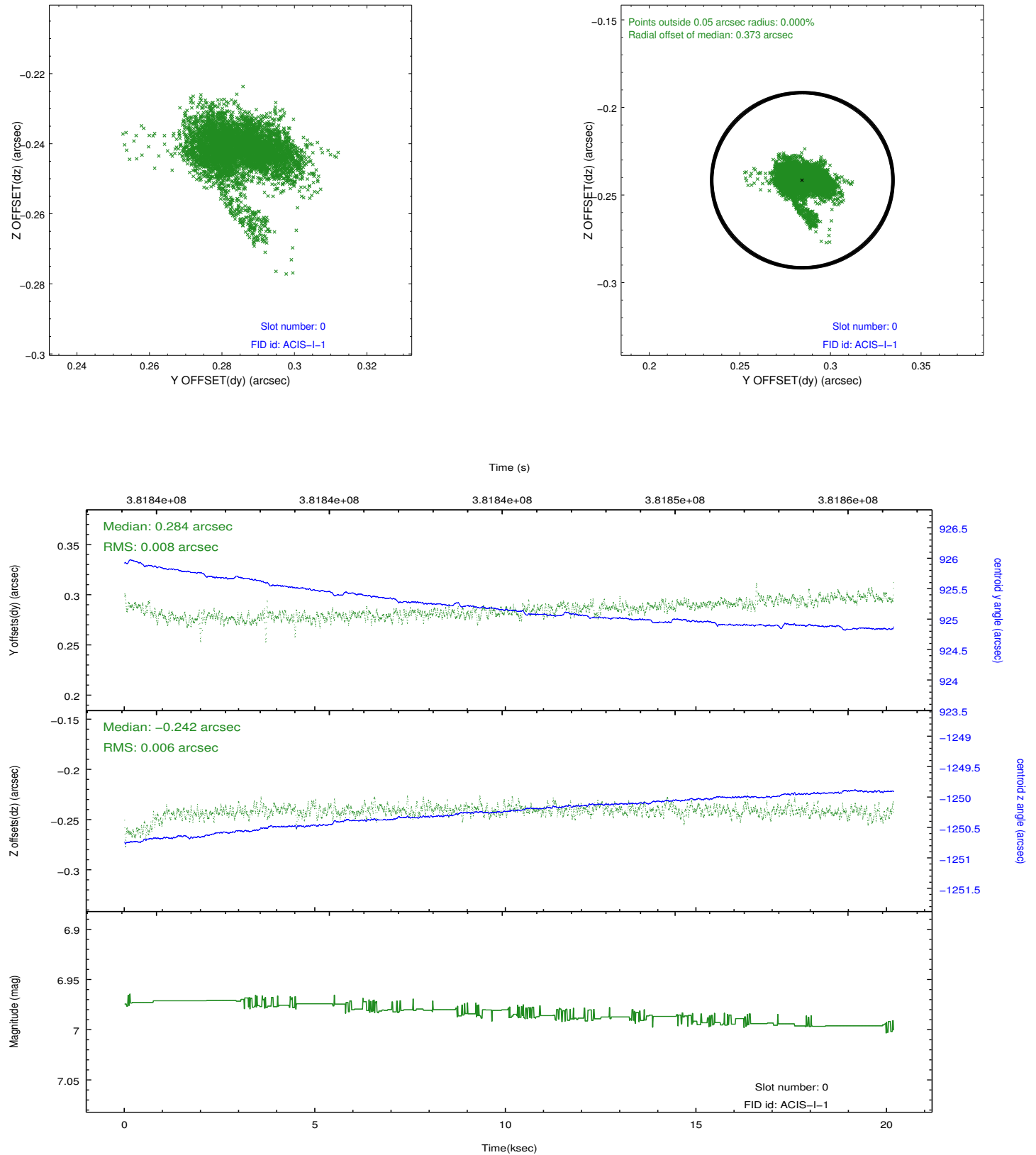


## 2.4.5 Slot 7

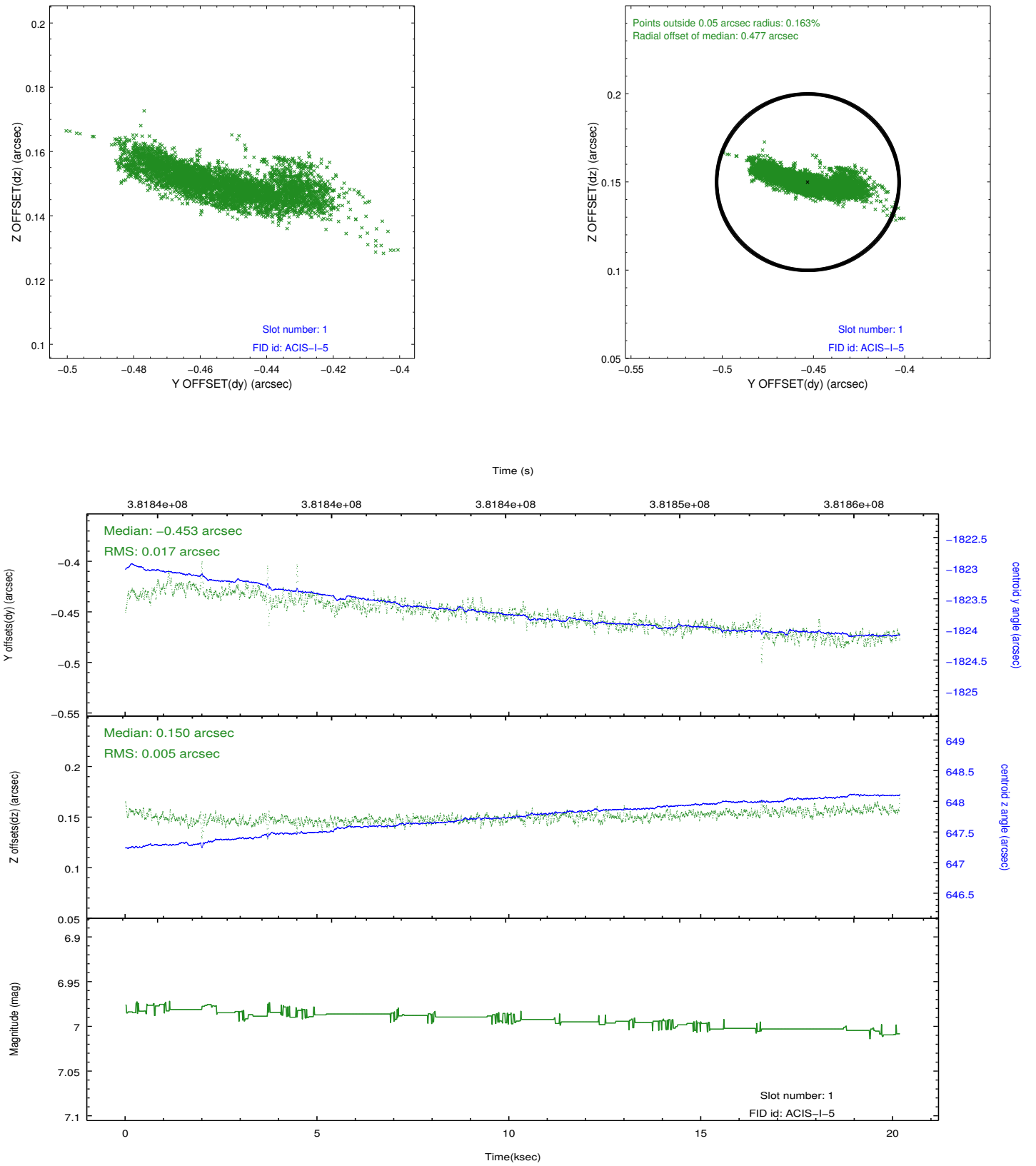


## 2.5 FID Slots

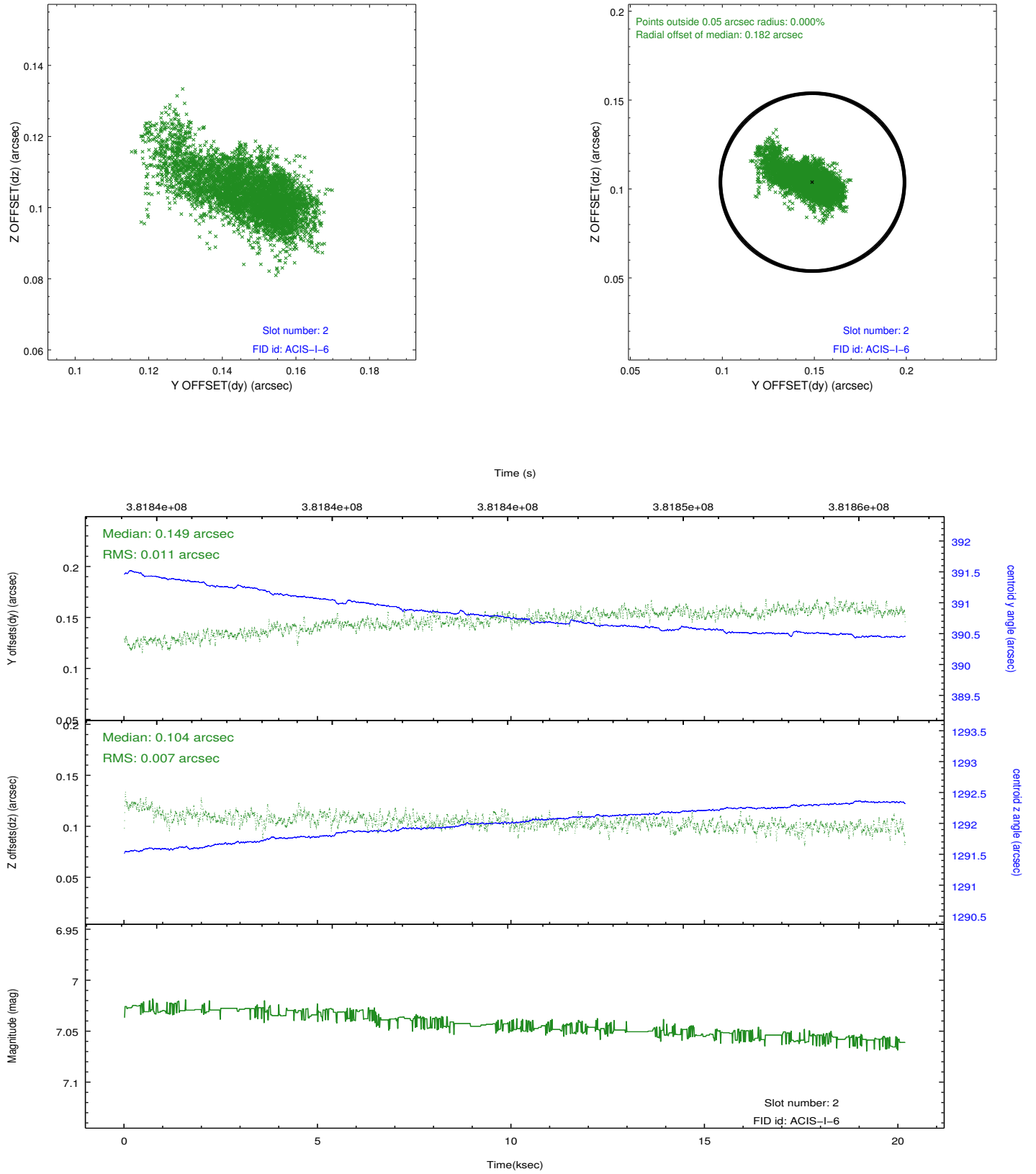
### 2.5.1 Slot 0



## 2.5.2 Slot 1

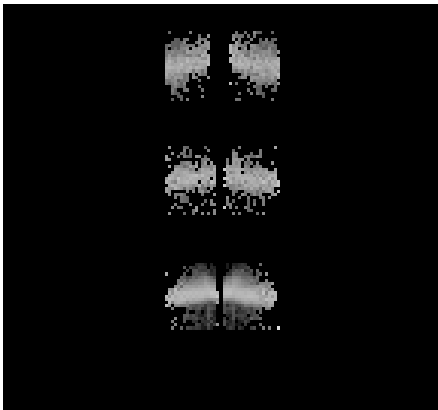


### 2.5.3 Slot 2

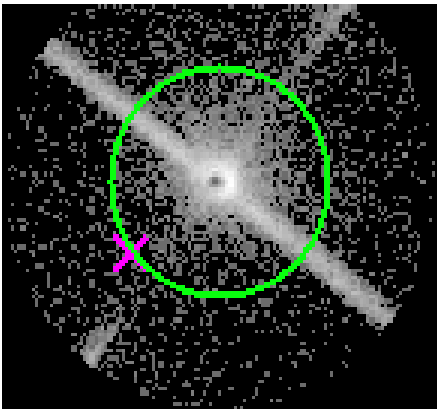


# 3 Gratings

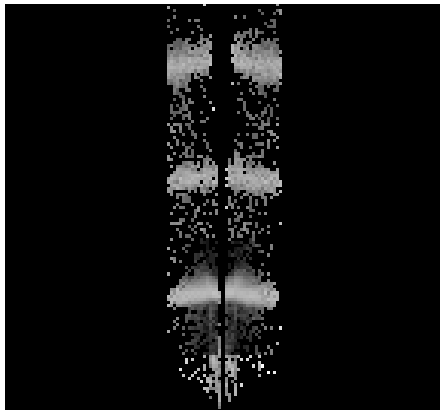
## 3.1 LETG Arm



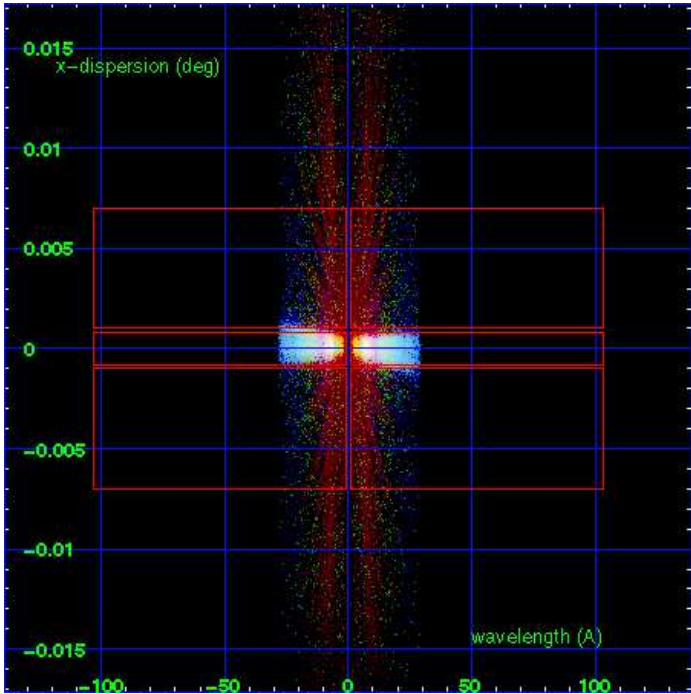
LETG Order Sort 123



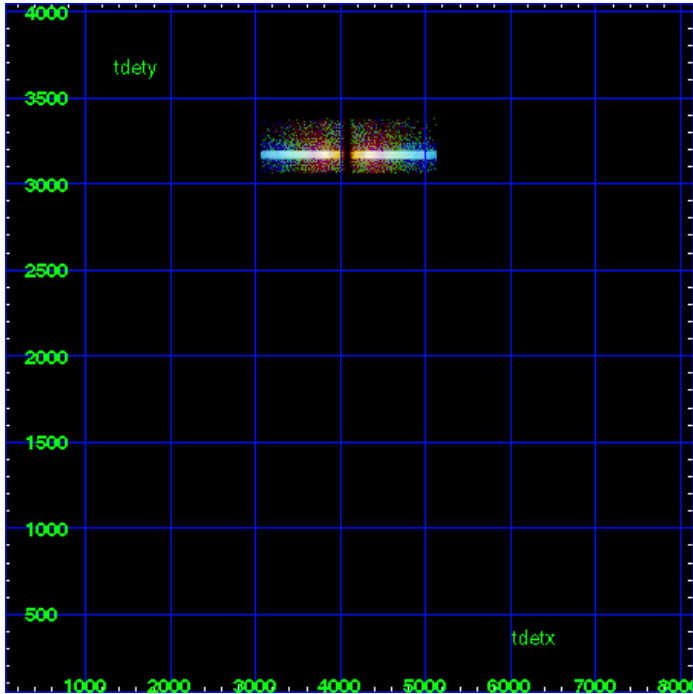
LETG Zero Order



LETG Order Sort ALL

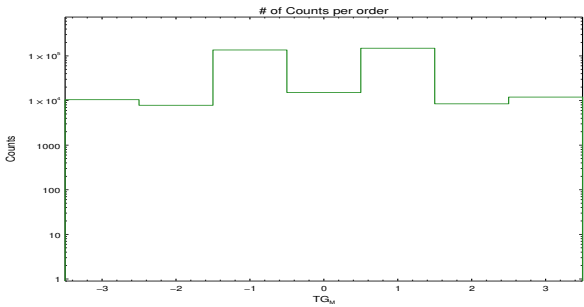


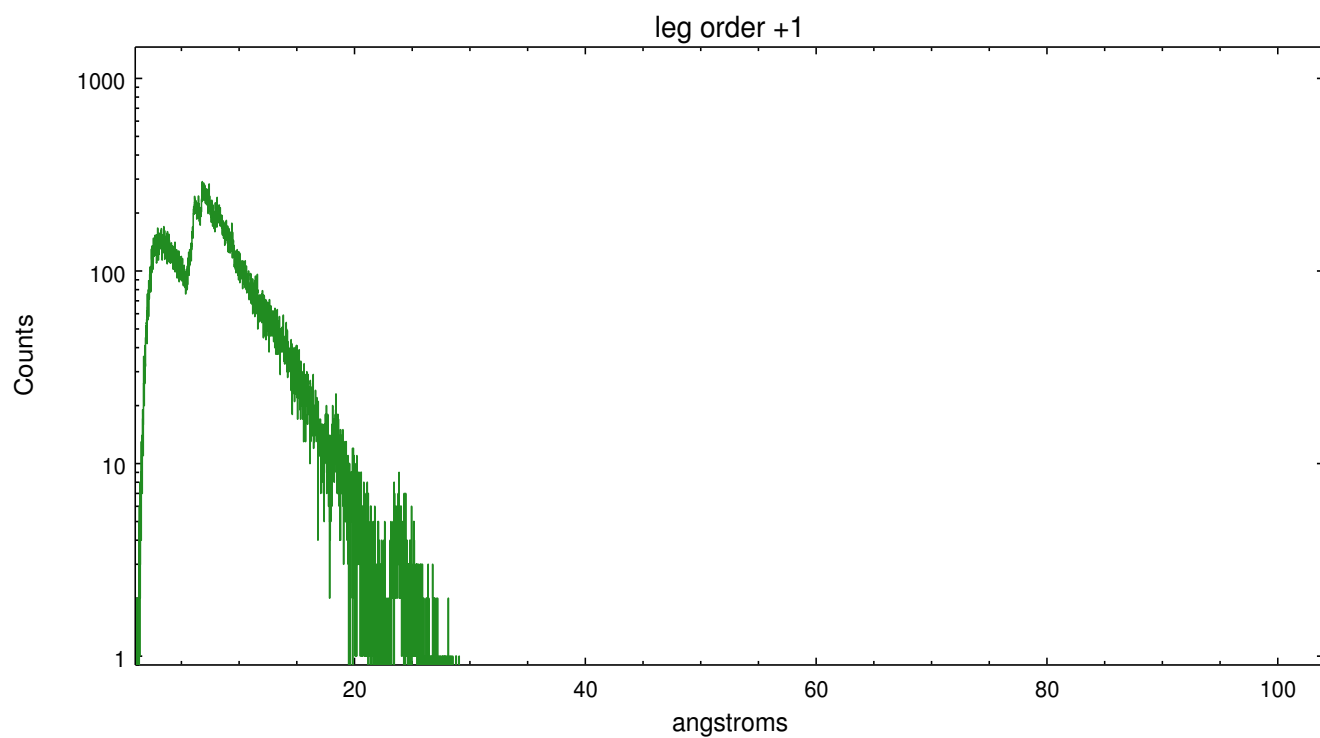
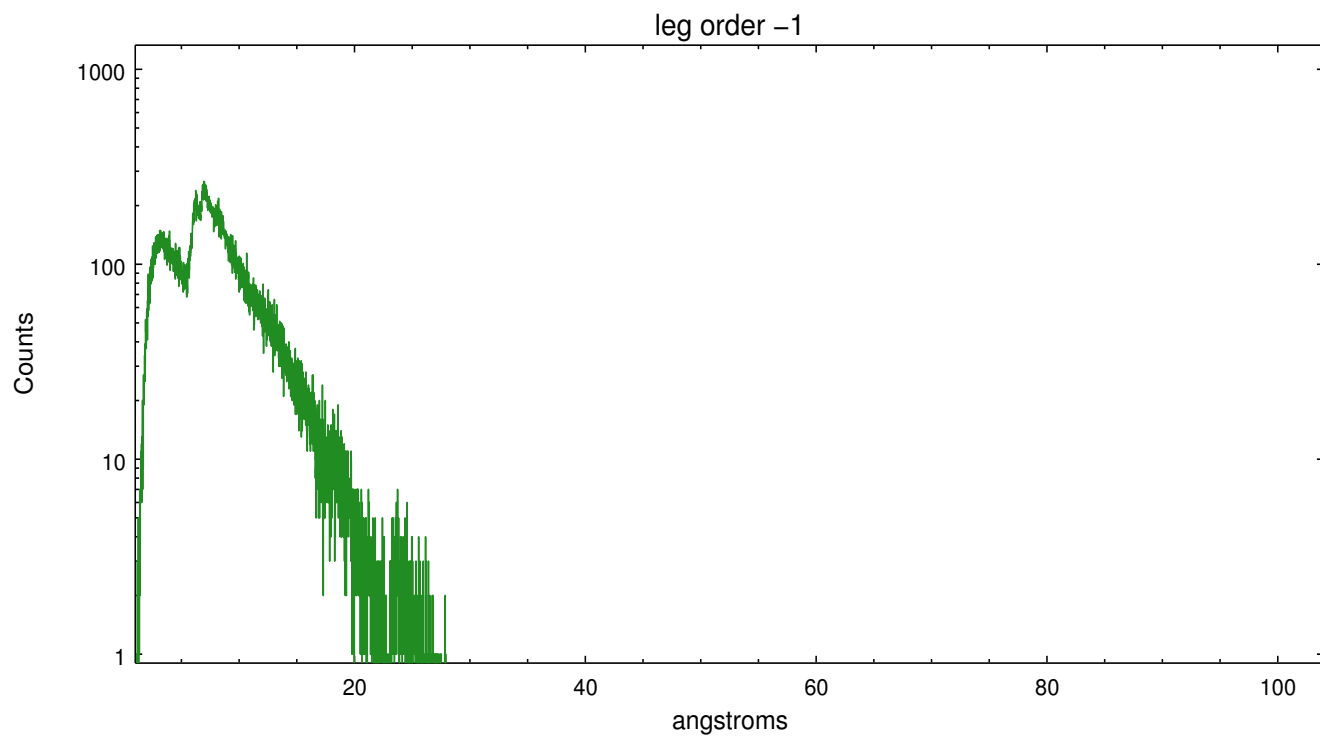
Spot Image LETG



Full Detector LETG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	10451	7824	135877	15134	148638	8437	11944







# A Summary

## A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2012.07.25
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	20.177900155187

## A.2 Comments

Used flat order-sorting in `tg_resolve_events`, since there is no 'osip' table for ACIS-I.

===

```
pset grt_lev15 osipfile=none===
```

```
pset grt_lev15 osort_lo=0.3===
```

```
pset grt_lev15 osort_hi=0.3===
```

===

Zeroth order piled up. Standard data processing software did not correctly locate the zeroth order due to pileup. Manual intervention was used to input the correct sky coordinates ( $x=4120.0$ ,  $y=4114.25$ ) into the `*src1a.fits` file table. These corrected coordinates were determined by eye because neither the pipeline tool `tgdetect` nor the `findzero` tool were successful in identifying the zeroth order so close to a chip boundary. The determination of the position by eye is expected to be in error by up to 1-2 pixels. The newly determined zeroth order coordinates have been placed in the `*src1a.fits` file, replacing the coordinates determined by `tgdetect`. Note that these corrected coordinates of the zeroth order cannot be reproduced by running `tgdetect` on the data.

===

The fid 1 radial median offset of 0.477 arcsec is acceptable for this ACIS CAL observation with a `sim_z_offset` of -19.99mm.