# V&V Reference Report
# L2 ASCDS Version : 8.4.3

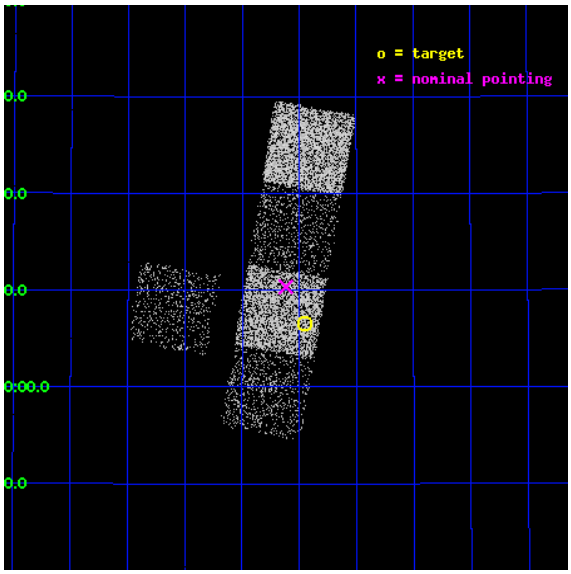
Observation 12490 - L2 Version 2
Chandra X-Ray Center

L2 Processing Date : Feb 4 2012

## Contents

# 1 Front

| | | |
|---|---|---|
| seq_num | 401231 | Sequence number |
| obs_id | 12490 | Observation id |
| title | The Nearest and Brightest Quiescent Low Mass X-ray Binaries | Propos |
| observer | Prof. Robert Rutledge | Principal investigator |
| object | 1RXS J143157.4+370635 | Source name |
| dtycycle | 0 |   |
| cycle | P | events from which exps? Prim/Second/Both |
| ra_targ | 217.989167 | Observer's specified target RA [deg] |
| dec_targ | 37.109722 | Observer's specified target Dec [deg] |
| ra_nom | 218.02926160462 | Nominal RA [deg] |
| dec_nom | 37.17262154601 | Nominal Dec [deg] |
| roll_nom | 99.778481213422 | Nominal Roll [deg] |
| revision | 2 | Processing version of data |
| ontime | 1137.70000875 | Sum of GTIs [s] |
| livetime | 1122.8351205731 | Livetime [s] |
| ontime3 | 1137.70000875 | Sum of GTIs [s] |
| ontime5 | 1137.70000875 | Sum of GTIs [s] |
| ontime6 | 1137.70000875 | Sum of GTIs [s] |
| ontime7 | 1137.70000875 | Sum of GTIs [s] |
| ontime8 | 1137.70000875 | Sum of GTIs [s] |
| l2events | 12628 | Number of level 2 events |

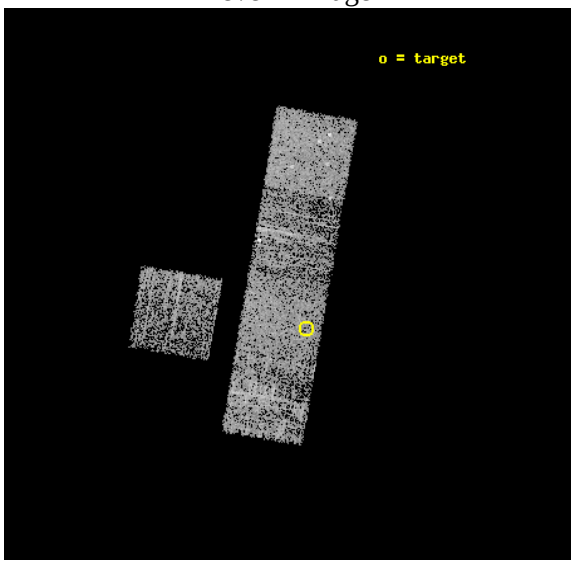


# 2 OBI

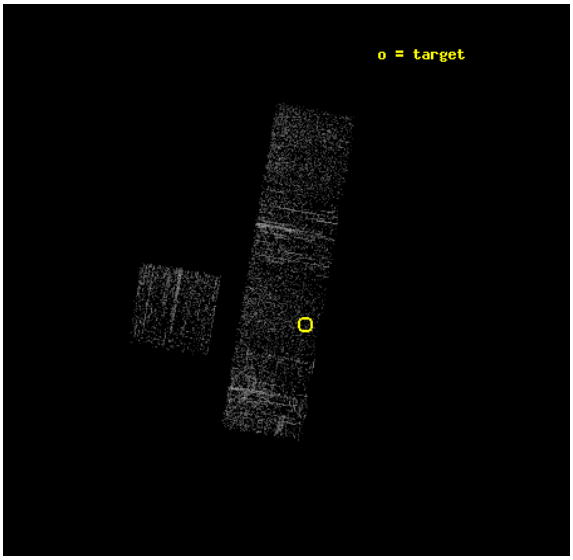
## 2.1 OBI

### 2.1.1 Images

Level 1 Image

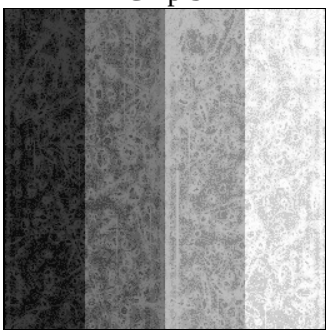



Level 1 Bad Events

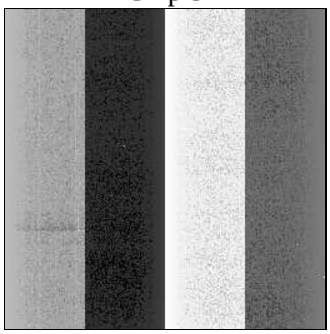



### 2.1.2 Bias

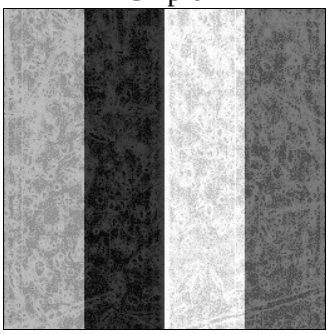
Chip 3



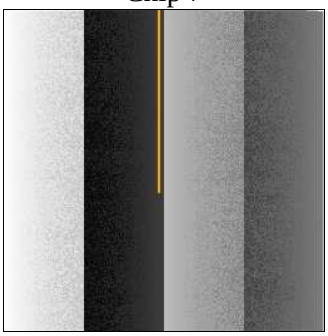
Chip 5



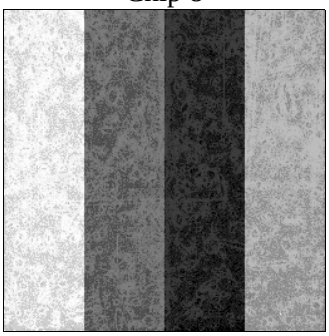
Chip 6



Chip 7



Chip 8



### 2.1.3 Parameters

| | | |
|---|---|---|
| obi_num | 0 | Obi number |
| ascdsver | 8.4.3 | Processing system revision |
| caldbver | 4.4.7 |   |
| date | 2012-02-04T19:38:00 | Date and time of file creation |
| revision | 2 | Processing version of data |

| | | |
|---|---|---|
| sched_exp_time | 1100.000000 | [s] Scheduled observation exposure time |
| ontime | 1137.70000875 | Sum of GTIs [s] |
| ontime3 | 1137.70000875 | Sum of GTIs [s] |
| ontime5 | 1137.70000875 | Sum of GTIs [s] |
| ontime6 | 1137.70000875 | Sum of GTIs [s] |
| ontime7 | 1137.70000875 | Sum of GTIs [s] |
| ontime8 | 1137.70000875 | Sum of GTIs [s] |
| l1events | 51035 | Number of level 1 events |

### 2.1.4 Events

| | **ccd 3** | **ccd 5** | **ccd 6** | **ccd 7** | **ccd 8** |
|---|---|---|---|---|---|
| level 1 events | 7380 | 13201 | 8982 | 10265 | 11207 |
| rejected events | 6608 | 6642 | 7729 | 5660 | 8531 |
| rejected % | 89% | 50% | 86% | 55% | 76% |

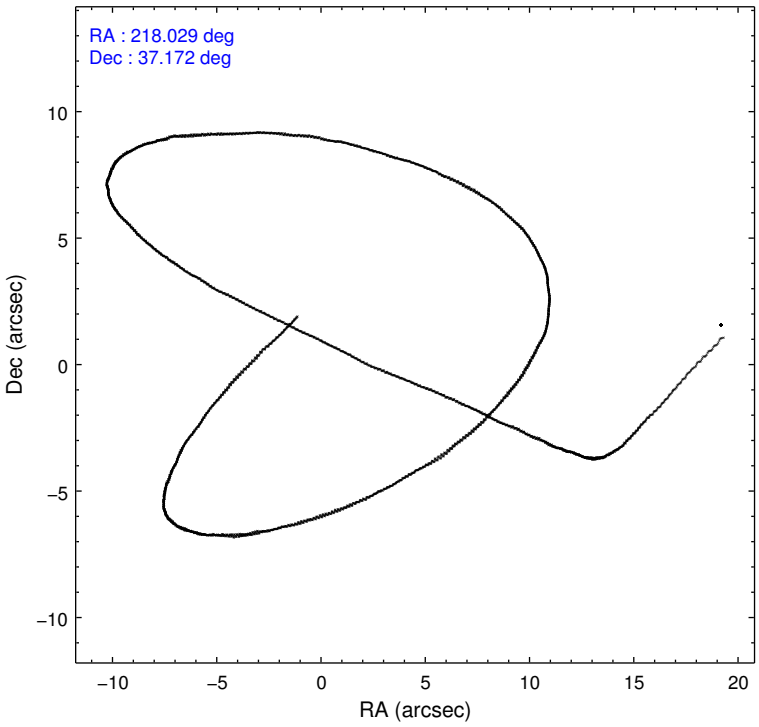
| | **ccd 3** | **ccd 5** | **ccd 6** | **ccd 7** | **ccd 8** |
|---|---|---|---|---|---|
| grade 0 events | 280 | 984 | 645 | 415 | 685 |
| | 3% | 7% | 7% | 4% | 6% |
| grade 1 events | 1 | 55 | 7 | 10 | 8 |
| | 0% | 0% | 0% | 0% | 0% |
| grade 2 events | 163 | 1818 | 206 | 935 | 737 |
| | 2% | 13% | 2% | 9% | 6% |
| grade 3 events | 91 | 179 | 87 | 425 | 265 |
| | 1% | 1% | 0% | 4% | 2% |
| grade 4 events | 81 | 198 | 113 | 354 | 246 |
| | 1% | 1% | 1% | 3% | 2% |
| grade 5 events | 401 | 930 | 398 | 999 | 541 |
| | 5% | 7% | 4% | 9% | 4% |
| grade 6 events | 161 | 3406 | 209 | 2493 | 760 |
| | 2% | 25% | 2% | 24% | 6% |
| grade 7 events | 6202 | 5631 | 7317 | 4634 | 7965 |
| | 84% | 42% | 81% | 45% | 71% |

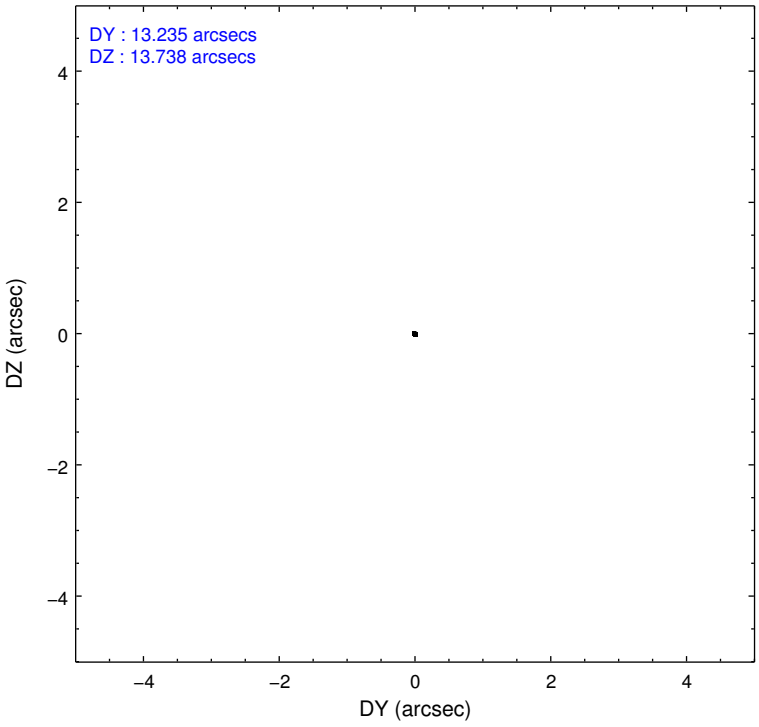
## 2.2 Compared Parameters

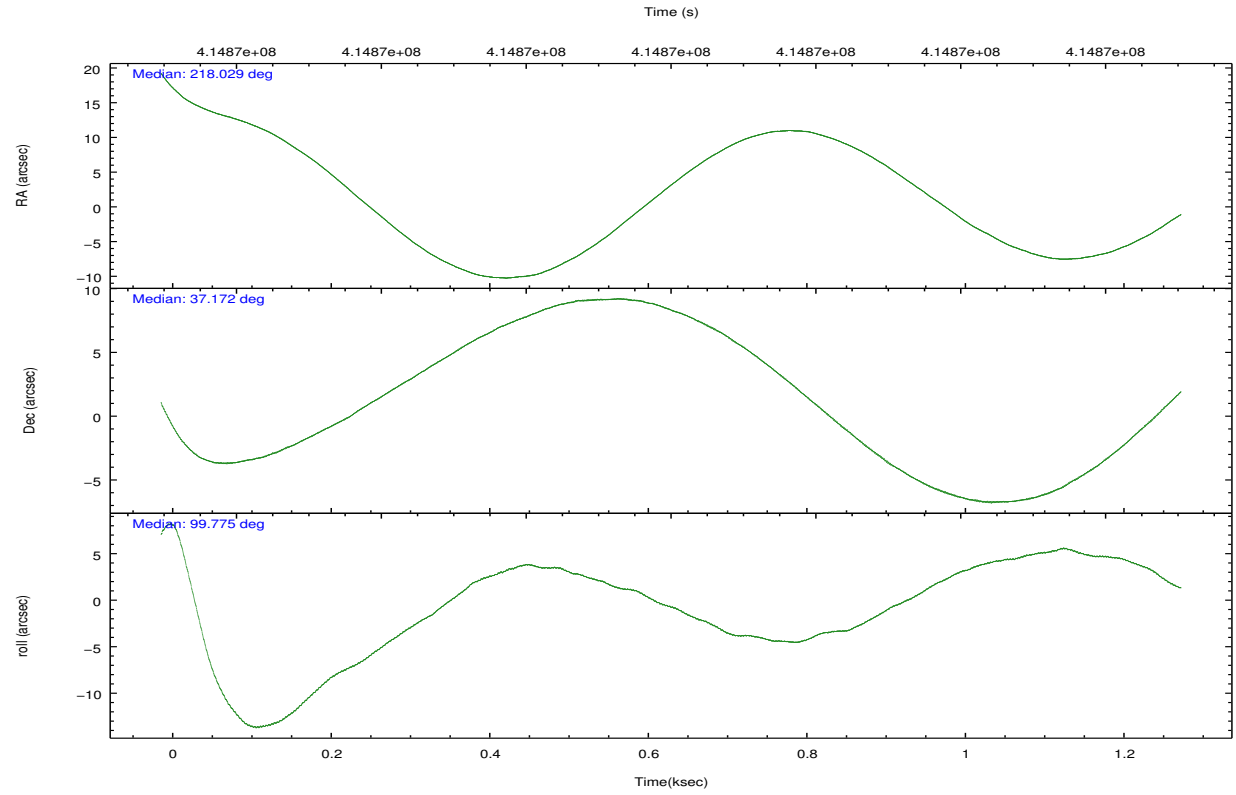
| Parameter | Planned | Actual |
|---|---|---|
| Instrument | ACIS | ACIS |
| Detector | ACIS-35678 | ACIS-35678 |
| Grating | NONE | NONE |
| Data mode | FAINT | FAINT |
| Observation mode | POINTING | POINTING |
| [deg] Pointing RA | 218.051595 | 218.0292616046242 |
| [deg] Pointing Dec | 37.152142 | 37.17262154601038 |
| [deg] Pointing Roll | 99.608109 | 99.77848121342207 |
| [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) | 414871532.184000 | 414870589.15023 |
| Observation start date | 2011-02-23T18:04:26 | 2011-02-23T17:49:49 |
| [s] Observation end time (MET) | 414872632.184000 | 414873312.57537 |
| Observation end date | 2011-02-23T18:22:46 | 2011-02-23T18:35:12 |
| Read mode | TIMED | TIMED |

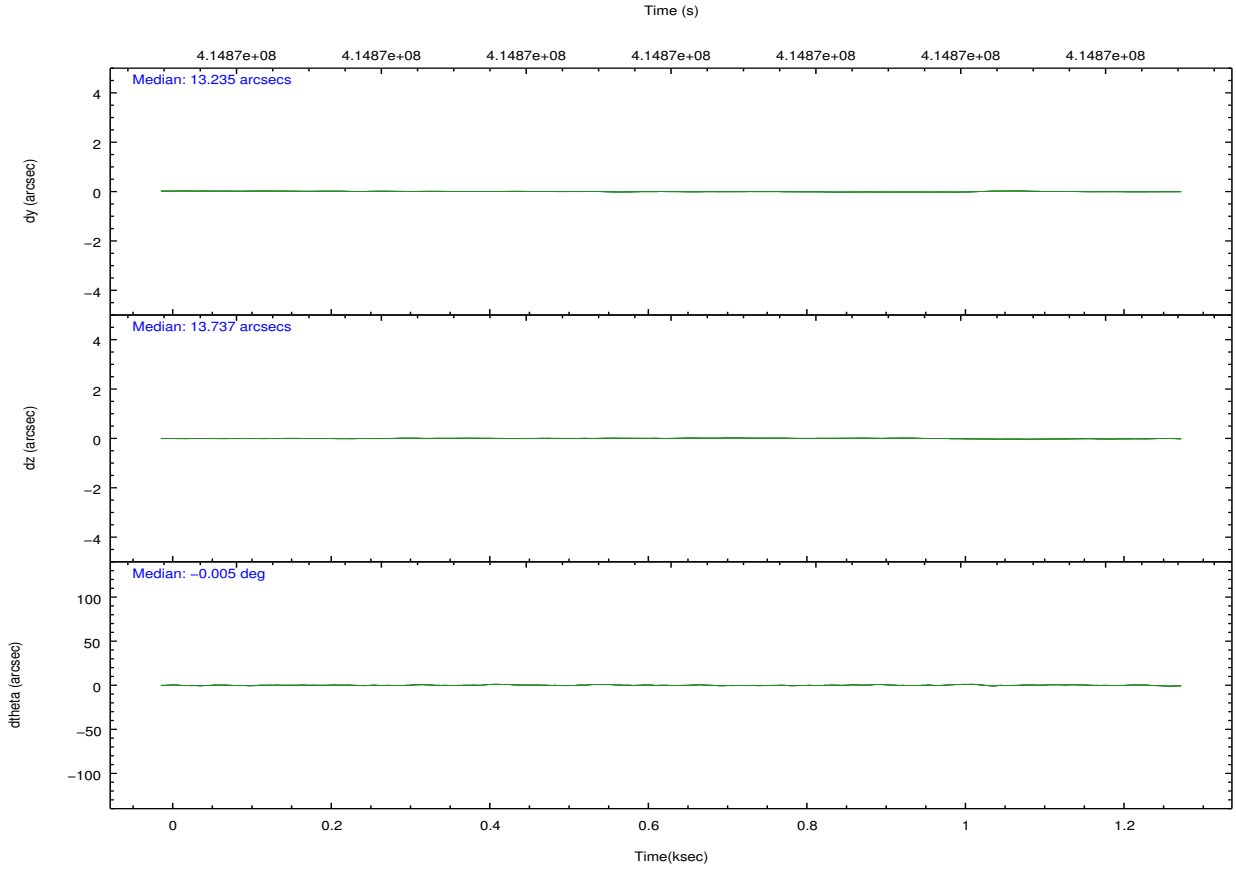
| Parameter | Planned | Actual |
|---|---|---|
| Obspar format version number | 7 | 7 |
| Obspar file type | PREDICTED | ACTUAL |
| Obspar update status | NONE | UPDATED |
| CCD I0 on | N | N |
| CCD I1 on | N | N |
| CCD I2 on | N | N |
| CCD I3 on | O1 | Y |
| CCD S0 on | N | N |
| CCD S1 on | Y | Y |
| CCD S2 on | Y | Y |
| CCD S3 on | Y | Y |
| CCD S4 on | Y | Y |
| CCD S5 on | N | N |
| 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 | 3.1 |

## 2.3 Aspect


RA : 218.029 deg
Dec : 37.172 deg
Dec (arcsec)
RA (arcsec)
10
5
0
−5
−10
−10
−5
0
5
10
15
20


DY : 13.235 arcsecs
DZ : 13.738 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−4
−2
0
2
4


Time (s)
4.1487e+08
4.1487e+08
4.1487e+08
4.1487e+08
4.1487e+08
4.1487e+08
4.1487e+08
Median: 218.029 deg
RA (arcsec)
Median: 37.172 deg
Dec (arcsec)
Median: 99.775 deg
roll (arcsec)
0
0.2
0.4
0.6
0.8
1
1.2
Time(ksec)

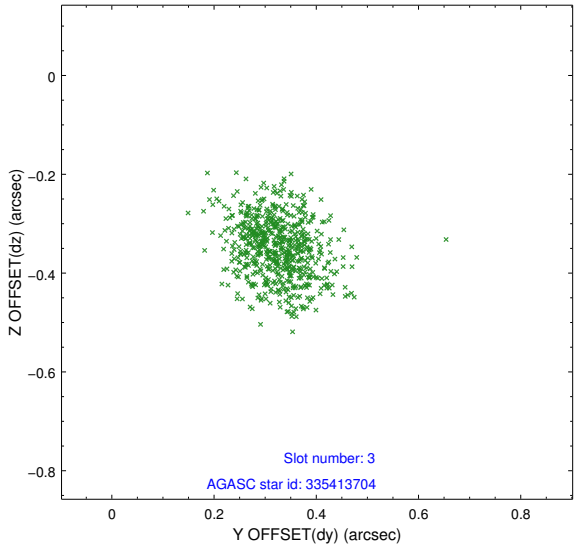

Time (s)
4.1487e+08
4.1487e+08
4.1487e+08
4.1487e+08
4.1487e+08
4.1487e+08
4.1487e+08
Median: 13.235 arcsecs
dy (arcsec)
Median: 13.737 arcsecs
dz (arcsec)
Median: −0.005 deg
dtheta (arcsec)
0
0.2
0.4
0.6
0.8
1
1.2
Time(ksec)

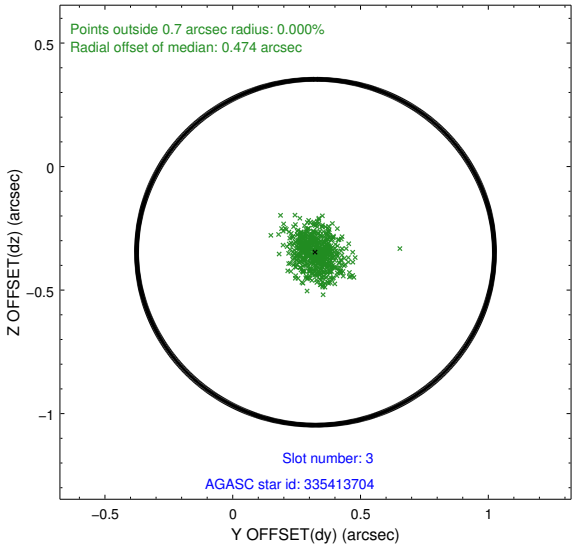
Slot Statistics

| slot | status | id | mag | n_pts | med_dy | med_dz | dr1 | dr2 | ra | dec | mean_y | mean_z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | FID | ACIS-S-1 | 7.14 | 314 | 0.069 | -0.021 | 0.007 | 0.014 | 0.000000 | 0.000000 | 929.94 | -1730.74 |
| 1 | FID | ACIS-S-4 | 7.13 | 314 | 0.130 | -0.014 | 0.005 | 0.010 | 0.000000 | 0.000000 | 2150.28 | 168.08 |
| 2 | FID | ACIS-S-5 | 7.17 | 314 | -0.226 | 0.047 | 0.006 | 0.013 | 0.000000 | 0.000000 | -1812.58 | 167.61 |
| 3 | GUIDE | 335413704 | 9.17 | 623 | 0.324 | -0.347 | 0.088 | 0.136 | 217.443182 | 36.847921 | -780.50 | 1909.55 |
| 4 | GUIDE | 335414200 | 8.32 | 629 | 0.361 | 0.010 | 0.081 | 0.140 | 218.557202 | 37.138861 | -285.18 | -1420.36 |
| 5 | GUIDE | 335419768 | 8.99 | 628 | 0.240 | 0.164 | 0.098 | 0.165 | 218.616802 | 37.055947 | -606.91 | -1546.33 |
| 6 | GUIDE | 335420408 | 8.10 | 629 | -0.181 | -0.056 | 0.072 | 0.114 | 217.531011 | 37.144309 | 225.84 | 1475.40 |
| 7 | GUIDE | 335422624 | 6.58 | 628 | -0.732 | 0.219 | 0.087 | 0.139 | 218.334455 | 36.959020 | -819.32 | -683.99 |

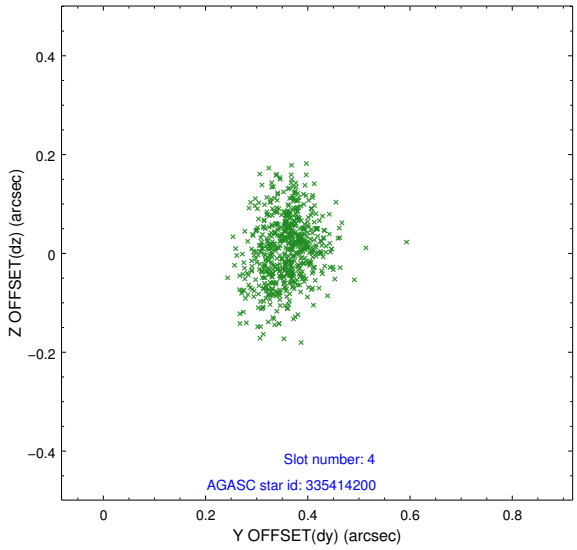
## 2.4 Star Slots

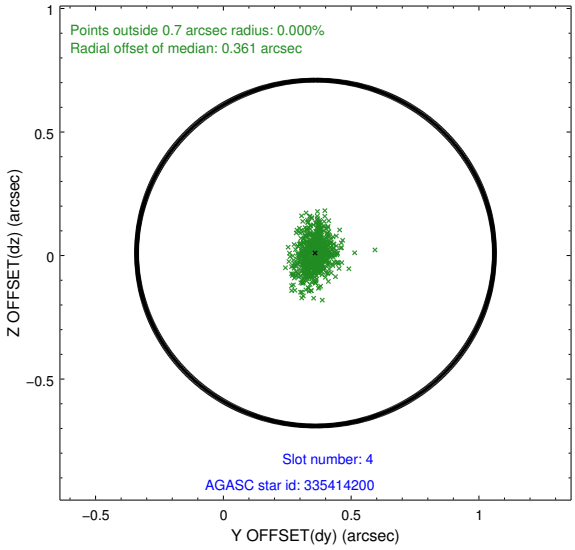
### 2.4.1 Slot 3

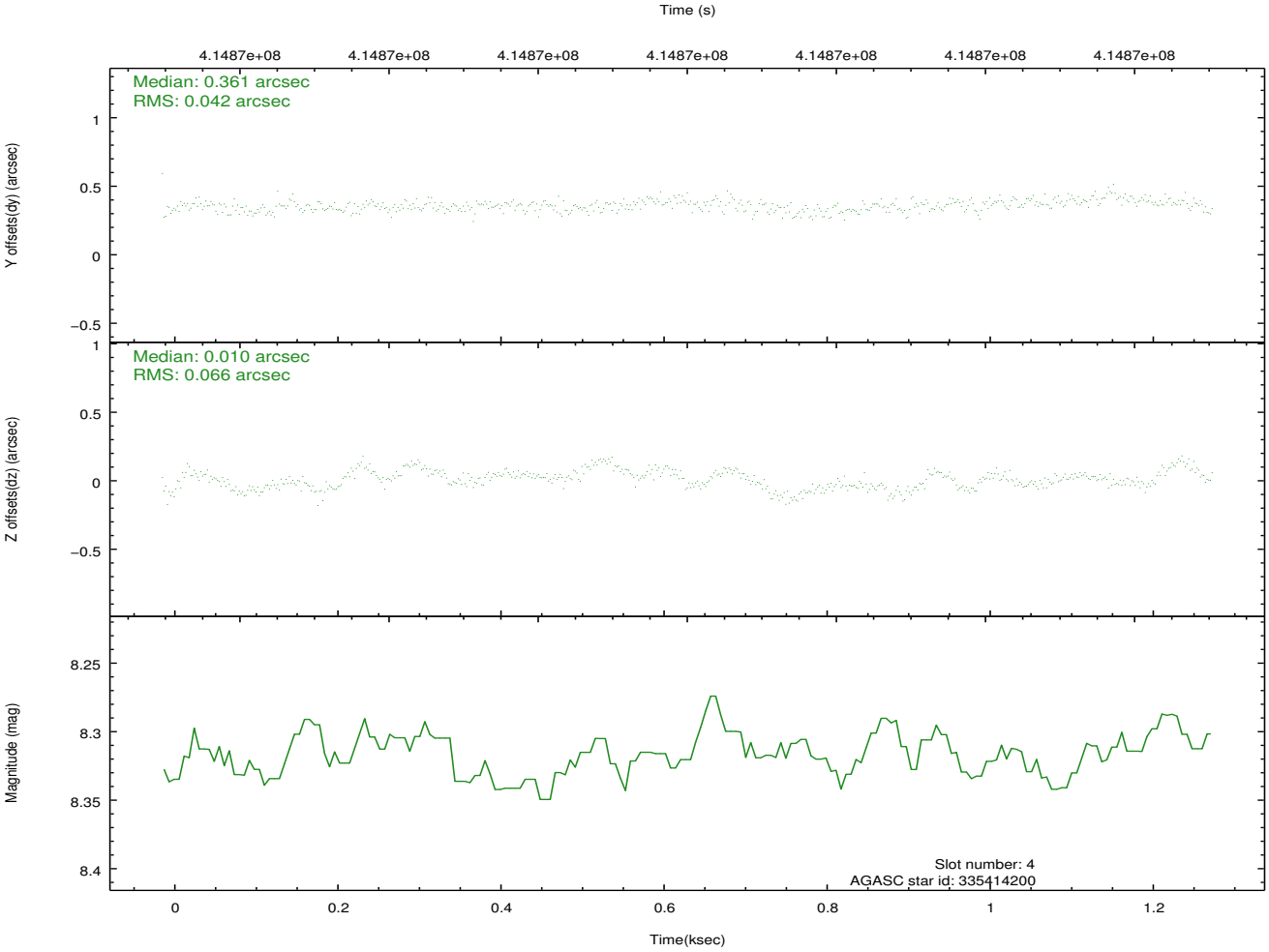


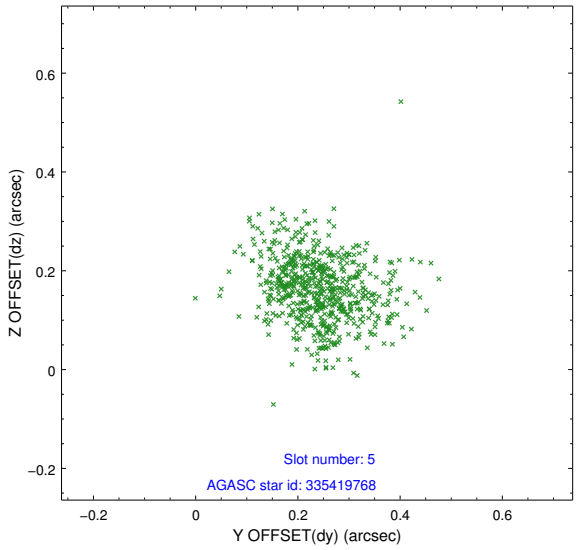

### 2.4.2 Slot 4

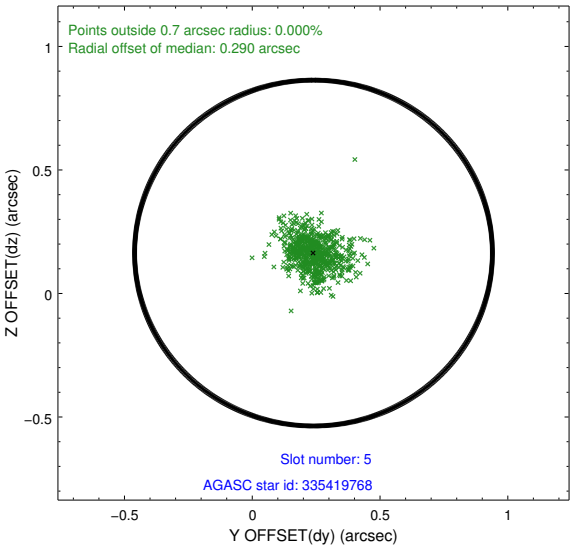

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 335414200

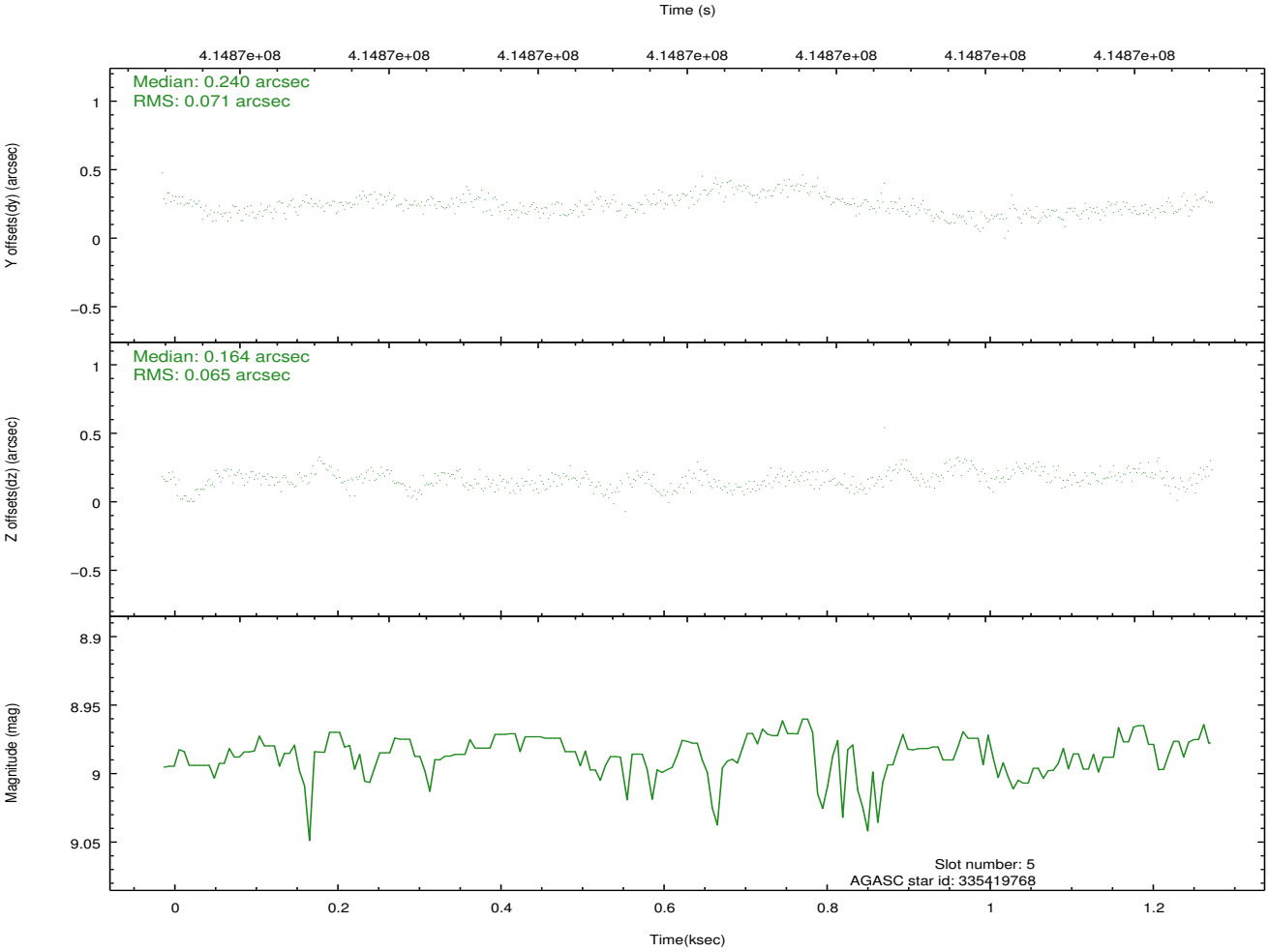

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.361 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 335414200


Time (s)
Median: 0.361 arcsec
RMS: 0.042 arcsec
Y offsets(dy) (arcsec)
Median: 0.010 arcsec
RMS: 0.066 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 335414200
Time(ksec)

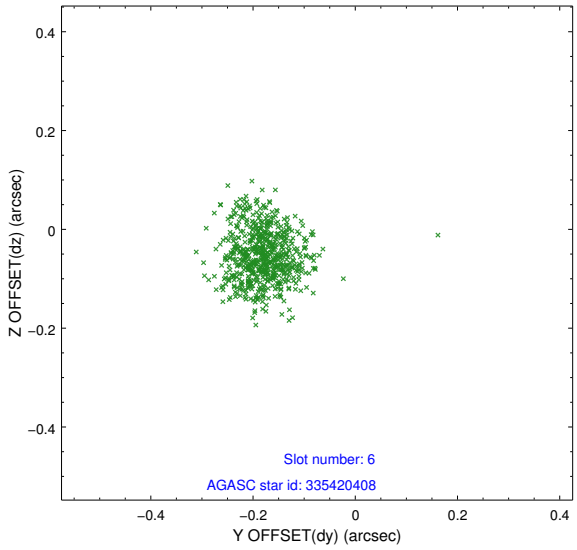
### 2.4.3 Slot 5

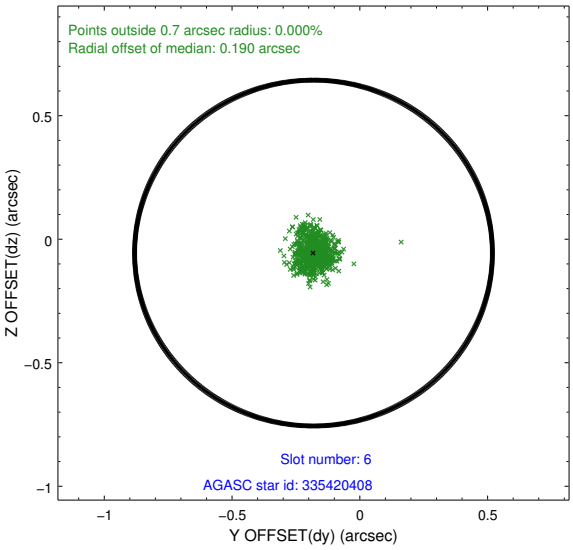

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 335419768

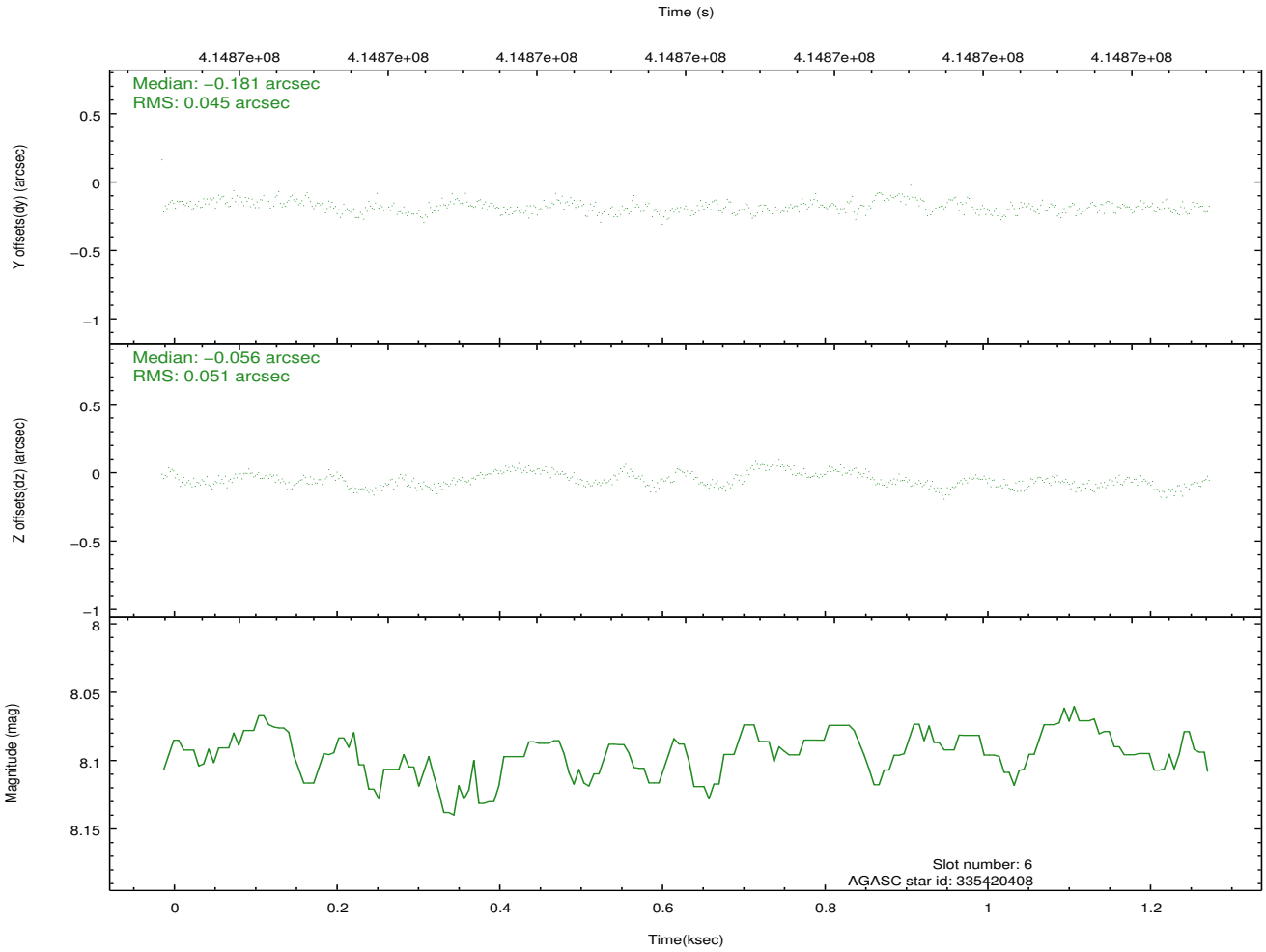

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.290 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 335419768


Time (s)
4.1487e+08
Median: 0.240 arcsec
RMS: 0.071 arcsec
Y offsets(dy) (arcsec)
Median: 0.164 arcsec
RMS: 0.065 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 335419768
Time(ksec)

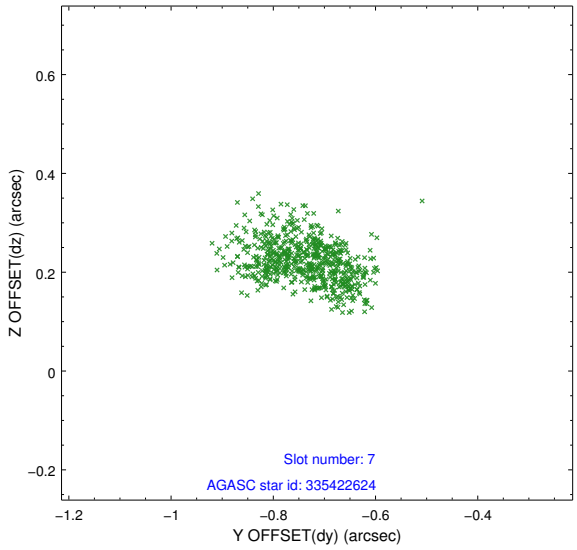
### 2.4.4 Slot 6

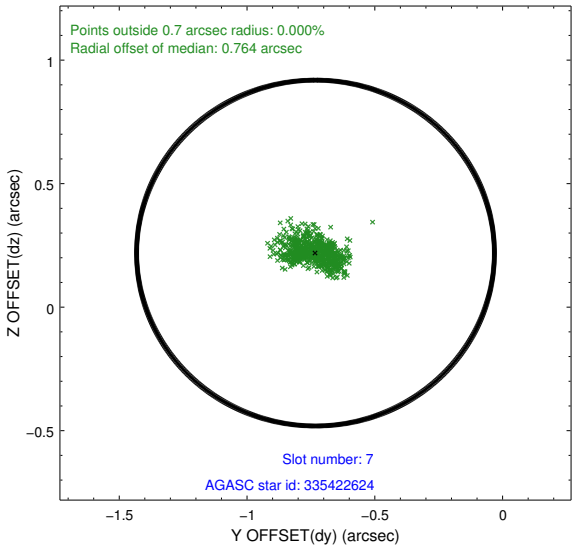

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 335420408

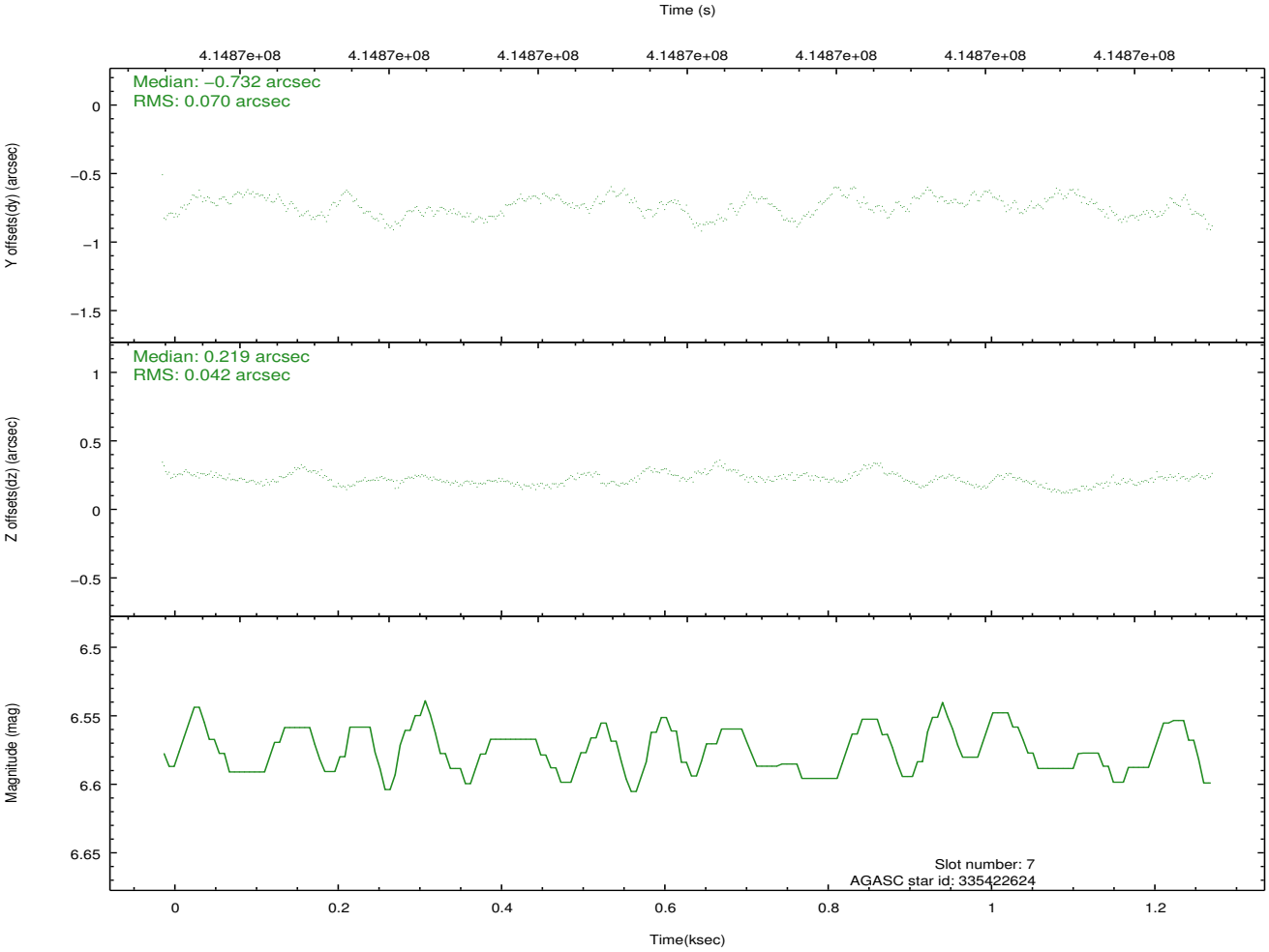

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.190 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 335420408


Time (s)
Median: −0.181 arcsec
RMS: 0.045 arcsec
Y offsets(dy) (arcsec)
Median: −0.056 arcsec
RMS: 0.051 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 335420408
Time(ksec)

### 2.4.5 Slot 7

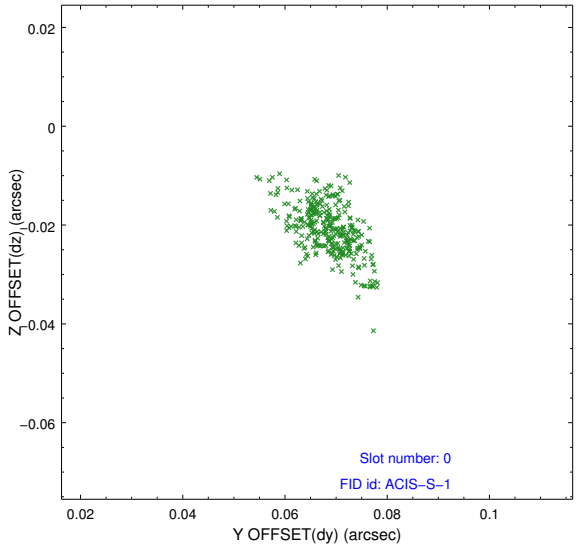

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 335422624

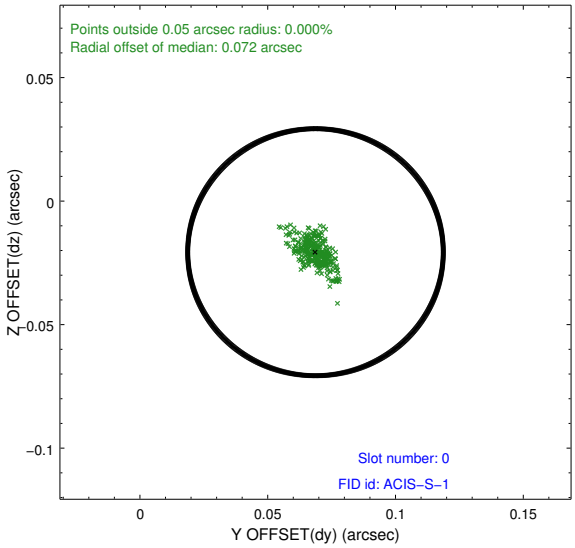

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.764 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 335422624

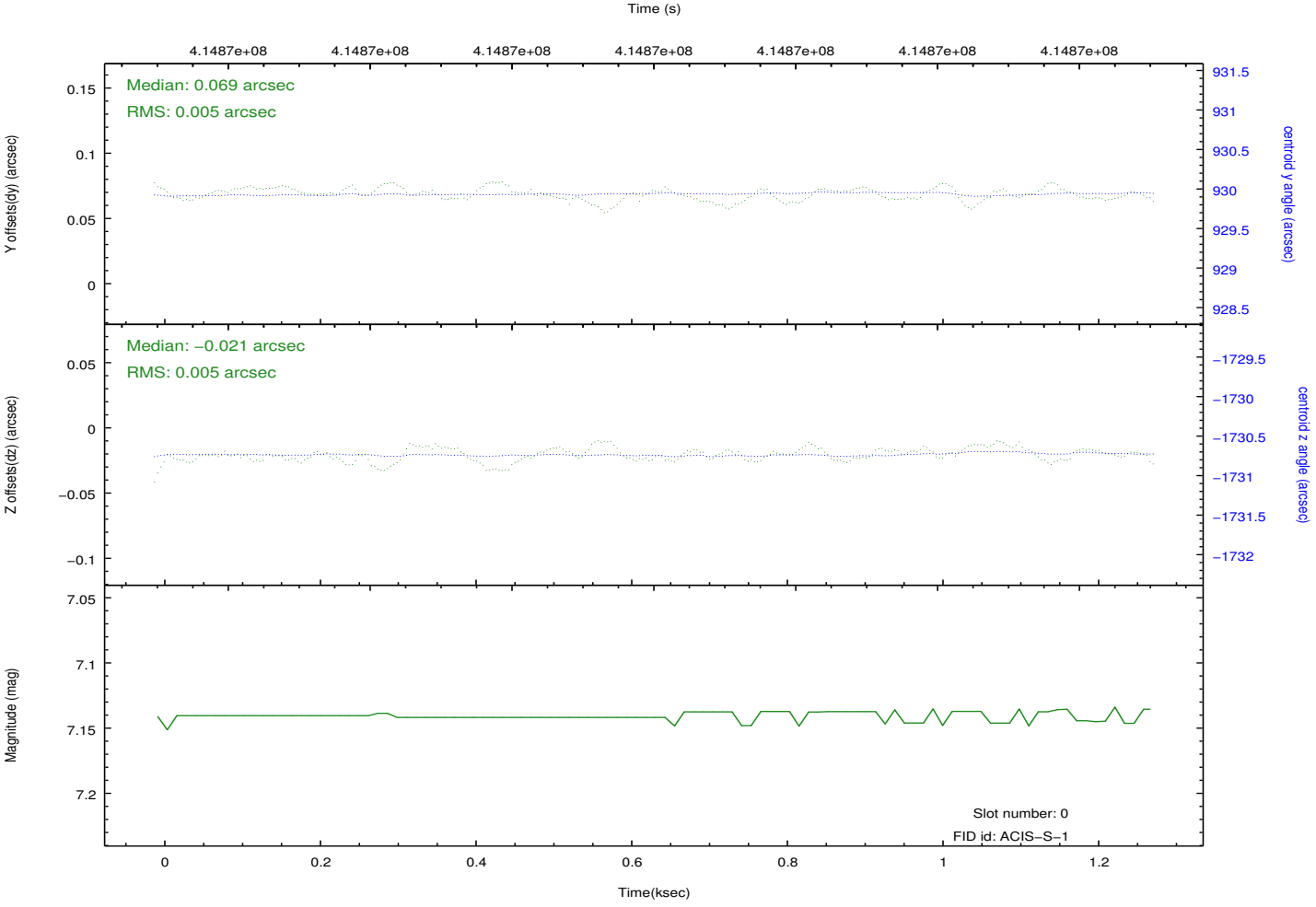

Time (s)
4.1487e+08
Median: −0.732 arcsec
RMS: 0.070 arcsec
Y offsets(dy) (arcsec)
Median: 0.219 arcsec
RMS: 0.042 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 335422624
Time(ksec)

## 2.5 FID Slots

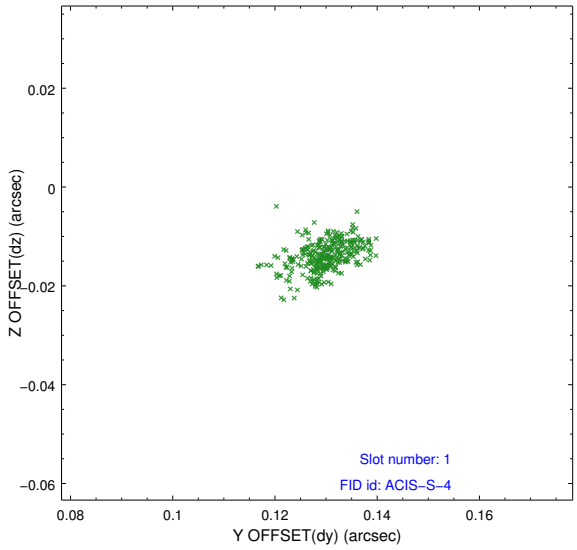
### 2.5.1 Slot 0

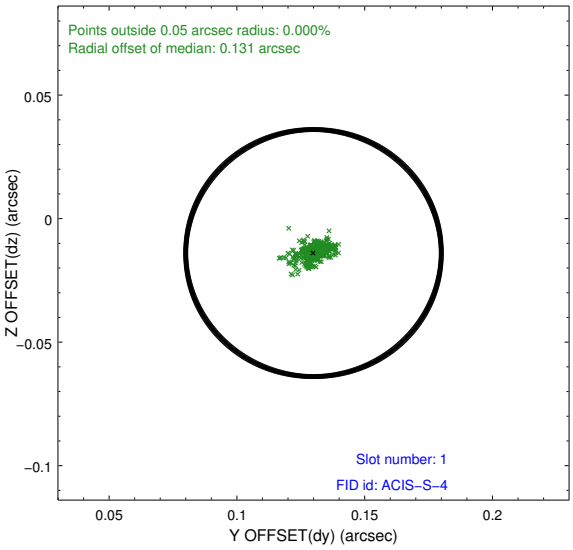


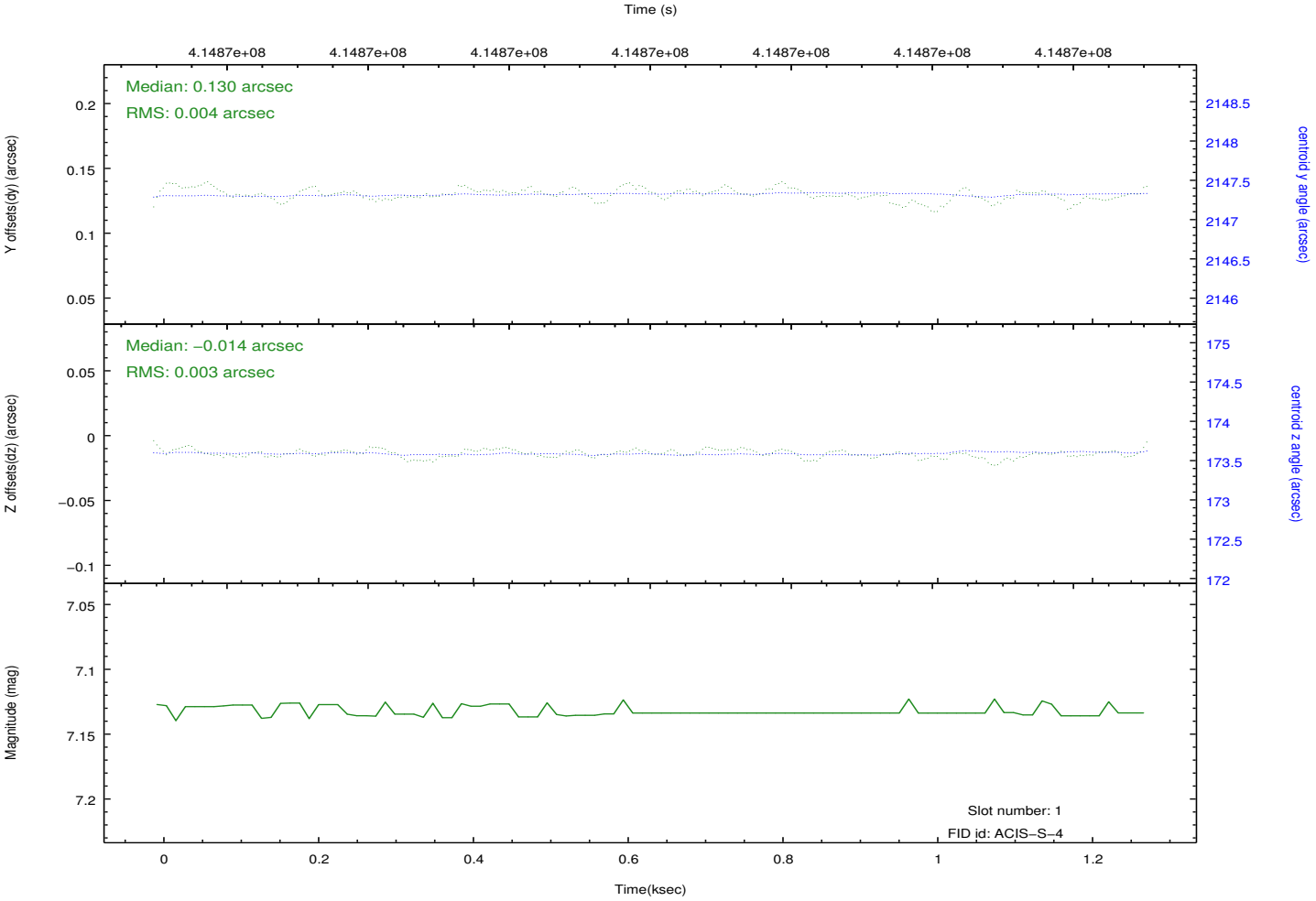



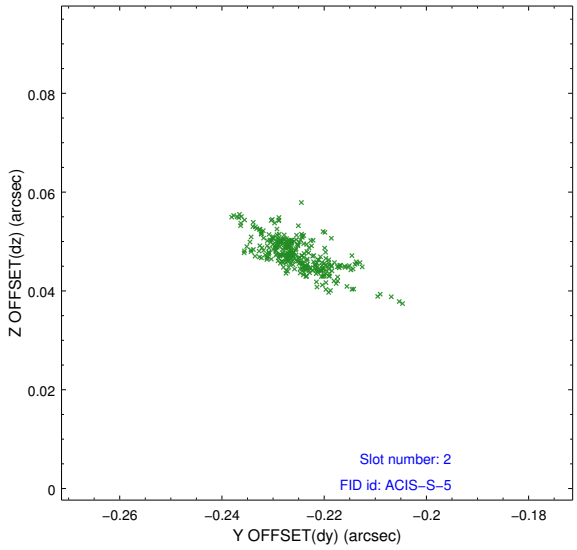
### 2.5.2 Slot 1

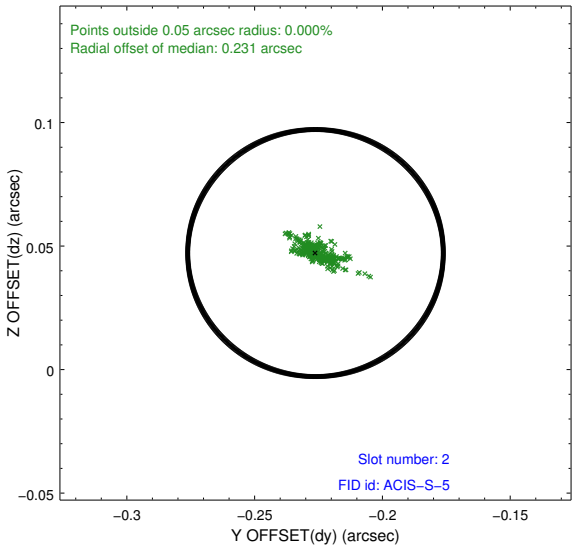

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4

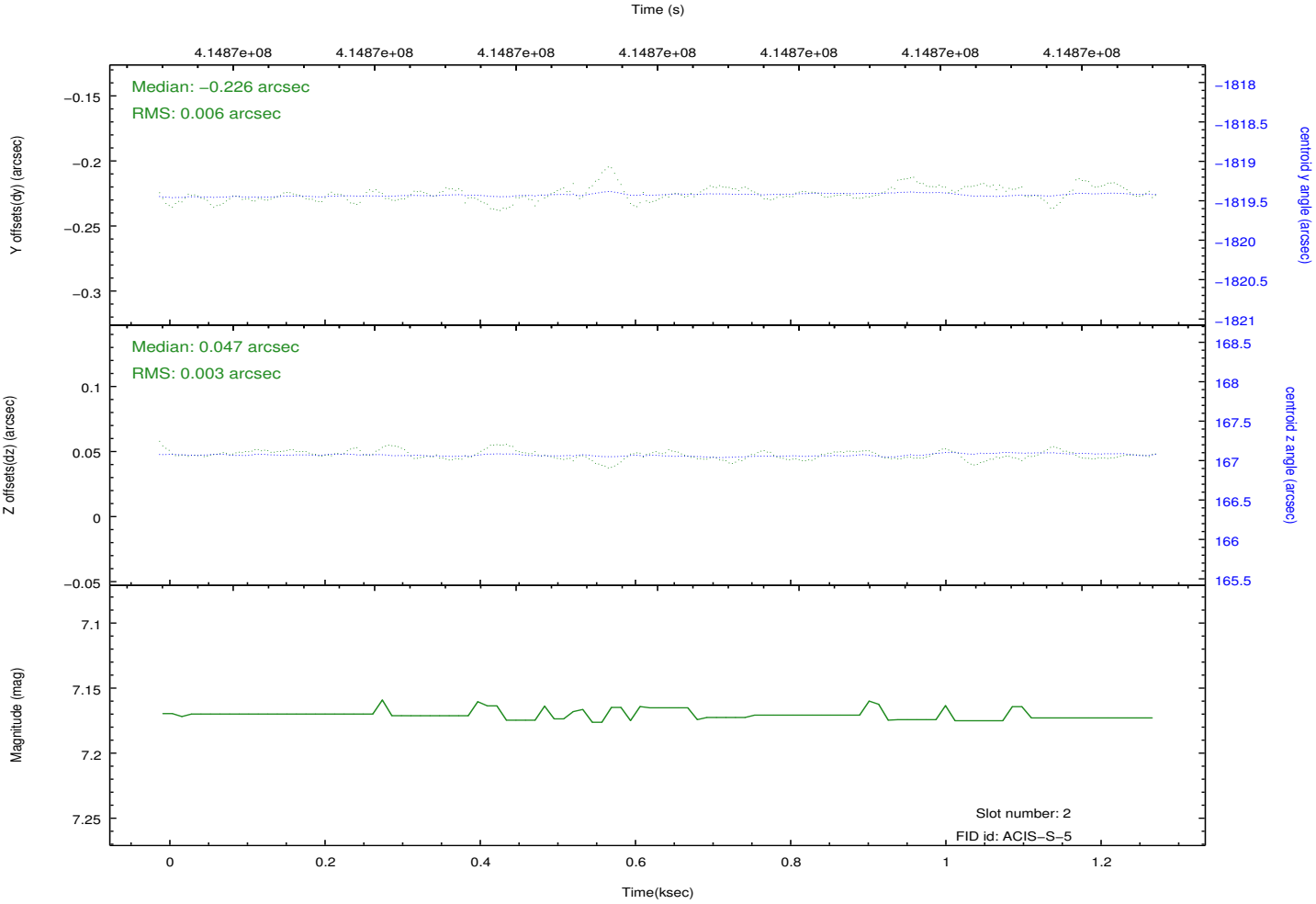

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.131 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4


Time (s)
Median: 0.130 arcsec
RMS: 0.004 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: −0.014 arcsec
RMS: 0.003 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: 0.231 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5


Time (s)
Median: −0.226 arcsec
RMS: 0.006 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.047 arcsec
RMS: 0.003 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 2
FID id: ACIS−S−5
Time(ksec)

# A Summary

## A.1 Status

| | |
|---|---|
| V&V Scientist | Jen Lauer |
| V&V Date (YYYY-MM-DD) | 2012.02.07 |
| V&V Edition | 1 |
| V&V Disposition and Status | OK |
| V&V Charge Time | 1.13770000875 |

## A.2 Comments

The data for this observation have been processed using the 'EDSER' sub-pixel event-repositioning algorithm of Li et al. (2004, ApJ, 610, 1204). Small-scale features should become sharper for sources near the aim point. The improvement will be less noticeable for off-axis sources where the size of the point-spread function is comparable to or larger than the size of an ACIS pixel. To take full advantage of the improvement, images should be binned on spatial scales smaller than the size of an ACIS pixel. Note that, at present, the point-spread function has not been calibrated for data to which the EDSER algorithm has been applied. If dither was disabled for the observation, then the algorithm can introduce artificial aliasing effects on spatial scales smaller than a pixel. If you would prefer to use no sub-pixel adjustment or to apply a coordinate randomization, then use acis_process_events to reprocess the data with the parameter pix_adj=NONE or RANDOMIZE, respectively.