

# Change fid light positions in SAUSAGE characteristics (Rev. 2, Feb. 1, 2007)

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## Table of Contents

- 1 Overview
- 2 Characteristics values
- 3 Fid position analysis

## 1 Overview

The fid light positions used in SAUSAGE were last updated in July 2001. Because of long-term alignment drift and shifts due to the ACA cooldowns (2003 and 2006), these positions now correspond to ACA angular coordinates that are incorrect by approximately 16 arcsec. This is sufficiently close to the default search box half-width (25 arcsec) for fids to warrant an update to the SAUSAGE characteristics. Because the OFLS star catalogs are no longer used as final flight products, the OFLS ODB fid position characteristics will not be updated.

## 2 Characteristics values

The current (as of 2007-Jan-17) fid light positions are stored within the SAUSAGE Science characteristics file. The new values are:

```
%Fid light positions.
Science.HRC_S.fidpos = ...
[    0.0571252    0.0227634
  -0.0595400    0.0224085
    0.0572545   -0.0272881
  -0.0594729   -0.0274048 ];
Science.HRC_I.fidpos = ...
[    0.0377667    0.0635461
  -0.0406593    0.0636239
    0.0586035   -0.0485306
  -0.0615813   -0.0484119 ];
Science.ACIS_S.fidpos = ...
[   -0.0448963    0.0845719
    0.0376268    0.0847734
  -0.00194703    0.0910544
  -0.104151     -0.0081088
    0.0888731   -0.0077944
  -0.0189102   -0.0391135 ];
Science.ACIS_I.fidpos = ...
[   -0.0447620    0.0410805
    0.0376852    0.0413759
```

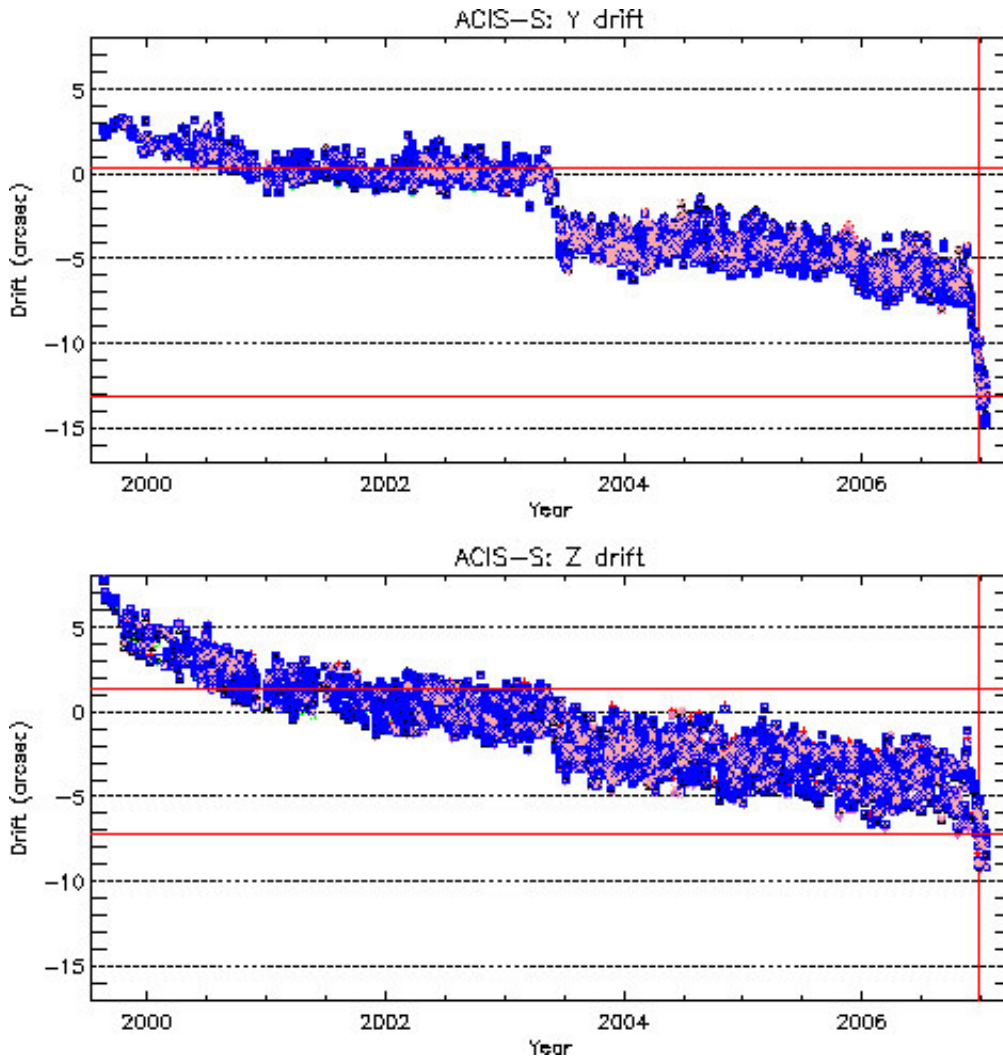
```

-0.00180980  0.0475558
-0.104142   -0.0513726
 0.0889680  -0.0512821
-0.0187749  -0.0826233 ];

```

### 3 Fid position analysis

The plot below is adapted from the ACA alignment drift page and shows the significant change in ACA alignment since mid-2001. Each data point shows the relative angular position of the ACIS-S fid lights (normalized to the mean during the first three months of 2003) as a function of time. The vertical red line shows the time of the 2006 ACA cooldown while the horizontal red lines indicate the mean Y and Z values during mid-2001 and early 2007 (after the second cooldown).



The delta values (2001 - 2007) for the different science instruments are in the range:

dY	-13 to -14 arcsec
dZ	-8 to -9 arcsec

Because these data do not include the subsequent warmup to -19C on 2007-Jan-16, the following uniform shift was used:

```
dY = -13.0 arcsec  
dZ = -8.0 arcsec
```

The plot above and delta values were generated with `plot_drift.pro` and the updated fid positions (`Science.<SI>.fidpos`) were calculated with `calc_ODB_values.pro`. All analysis was done in the directory `/proj/sot/ska/analysis/fid_pos/UPDATE_2007-Jan`.

### **Observed values**

The values below are the calculated means for fid data between 2006-12-01 to 2007-01-29. The values have been compensated for SIM-Z offset from the nominal values listed in the table.

<b>Instr</b>	<b>Fid</b>	<b>Yangle</b>	<b>Zangle</b>	<b>SIM-Z nom</b>	<b>N samples</b>
		<b>(arcsec)</b>	<b>(arcsec)</b>	<b>(arcsec)</b>	
ACIS-S	1	929.620	-1731.43	7.40000	17
ACIS-S	2	-766.697	-1735.44	7.40000	35
ACIS-S	4	2146.87	173.451	7.40000	38
ACIS-S	5	-1819.90	166.661	7.40000	41
ACIS-S	6	394.323	809.411	7.40000	16
ACIS-I	1	926.063	-837.552	78.1000	35
ACIS-I	2	-768.019	-843.709	78.1000	17
ACIS-I	4	2145.77	1062.77	78.1000	25
ACIS-I	5	-1822.27	1059.96	78.1000	45
ACIS-I	6	391.535	1704.59	78.1000	22
HRC-S	1	-1171.08	-463.980	7.50000	3
HRC-S	2	1228.93	-455.947	7.50000	3
HRC-S	3	-1173.31	566.407	7.50000	4
HRC-S	4	1228.85	569.955	7.50000	2
HRC-I	1	-769.122	-1302.41	7.80000	20
HRC-I	2	843.042	-1301.64	7.80000	19
HRC-I	3	-1197.58	1003.30	7.80000	22
HRC-I	4	1272.89	1003.68	7.80000	14