# Chandra Aimpoint Drifts

Jonathan McDowell

AIMPOINT GEOMETRY STUDY

- Tom Aldcroft – Aspect pipeline and calibration

- Ping Zhao – Optical axis measurements

- Jonathan McDowell – integrated study of aimpoint motions over mission lifetime

- Part of ongoing SDS support of the interface between analysis software and coordination

AIMPOINT GEOMETRY STUDY

- Optical Axis: the axis normal to the focal surface that goes through the best focus position

- Nominal optical axis: a fictitious approximation to the optical axis that we use in the ASOL files – the RA and Dec are of this axis

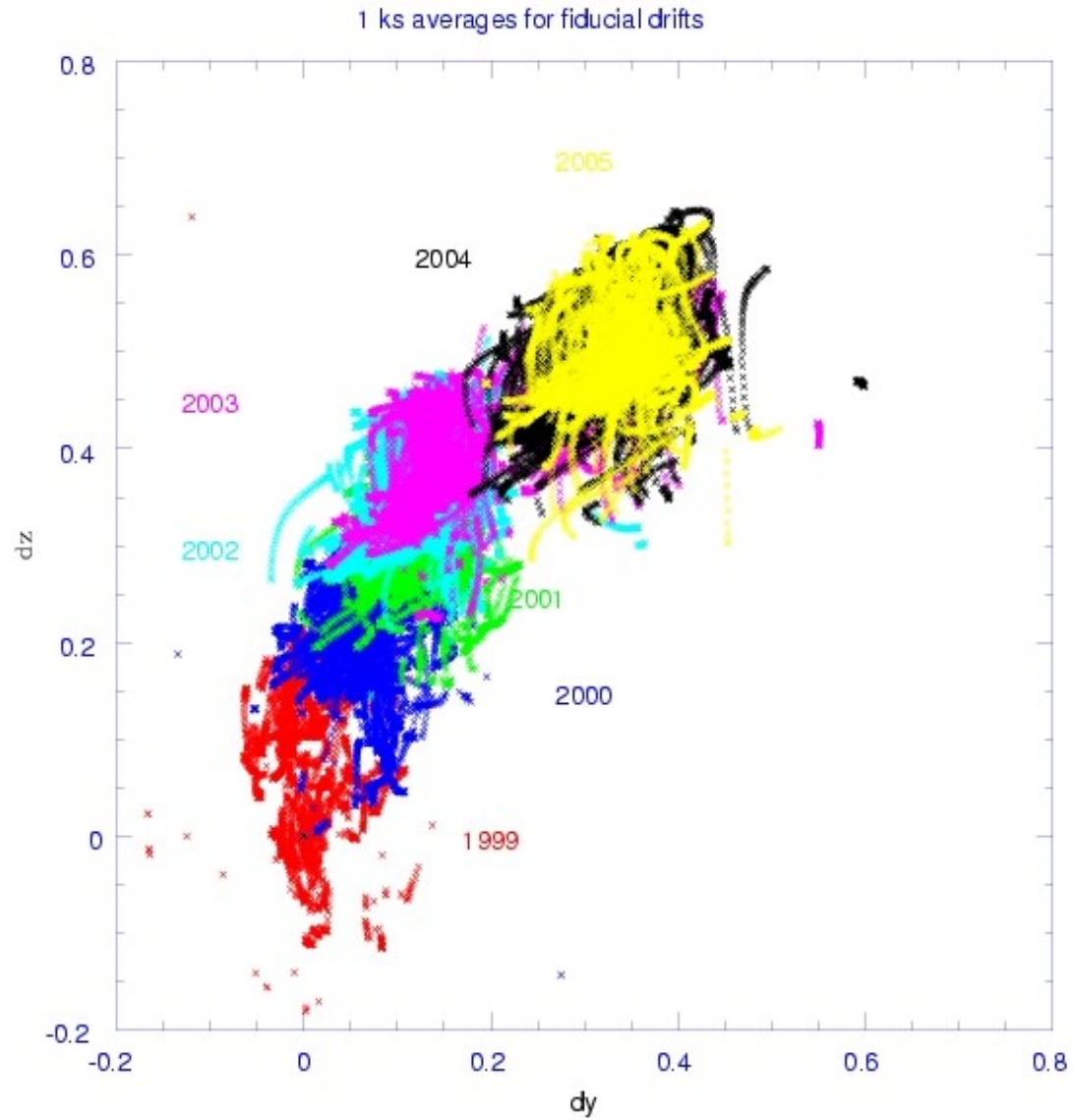- Aimpoint – the chip coordinates where the target coordinates specified by the user land
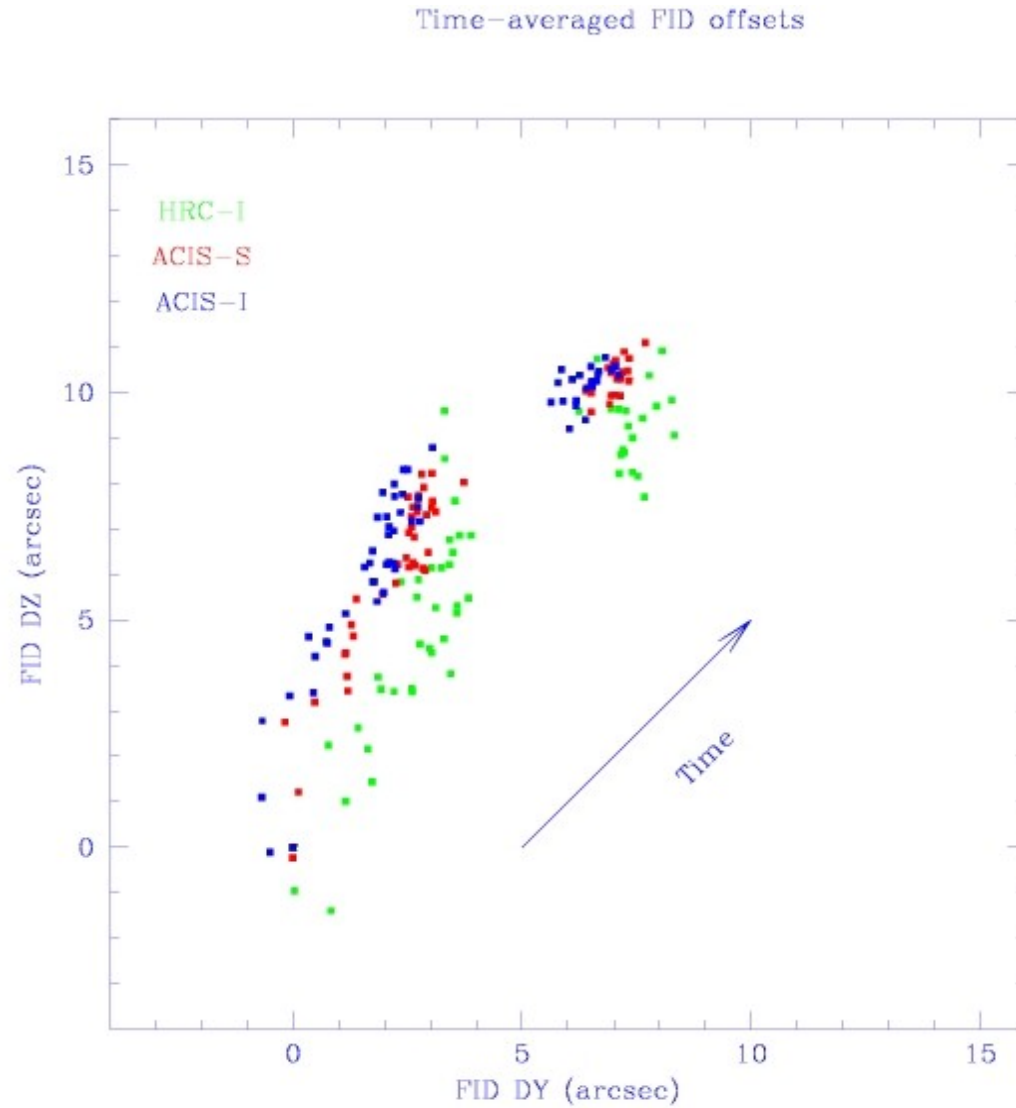
Chandra Geometry
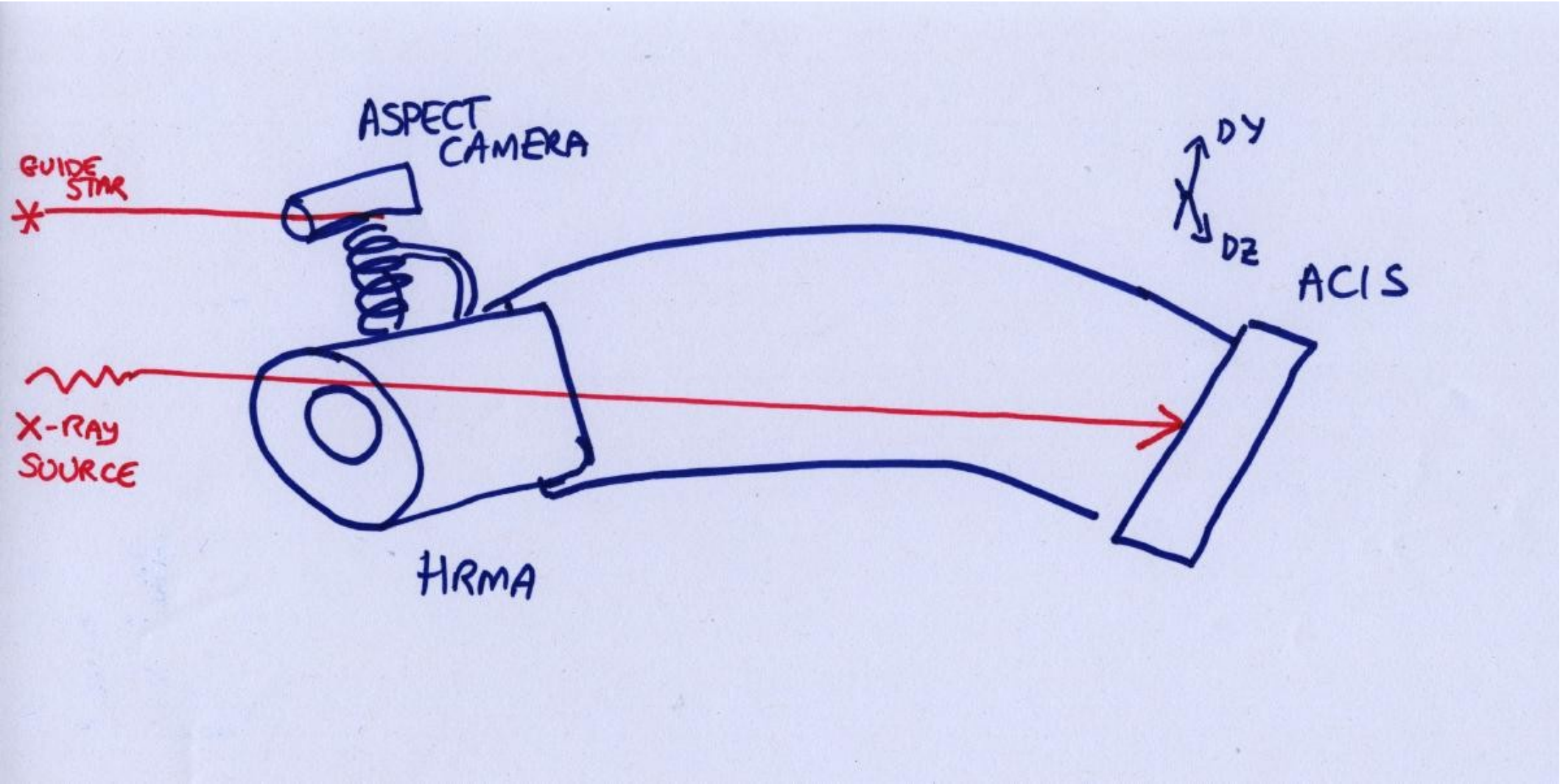
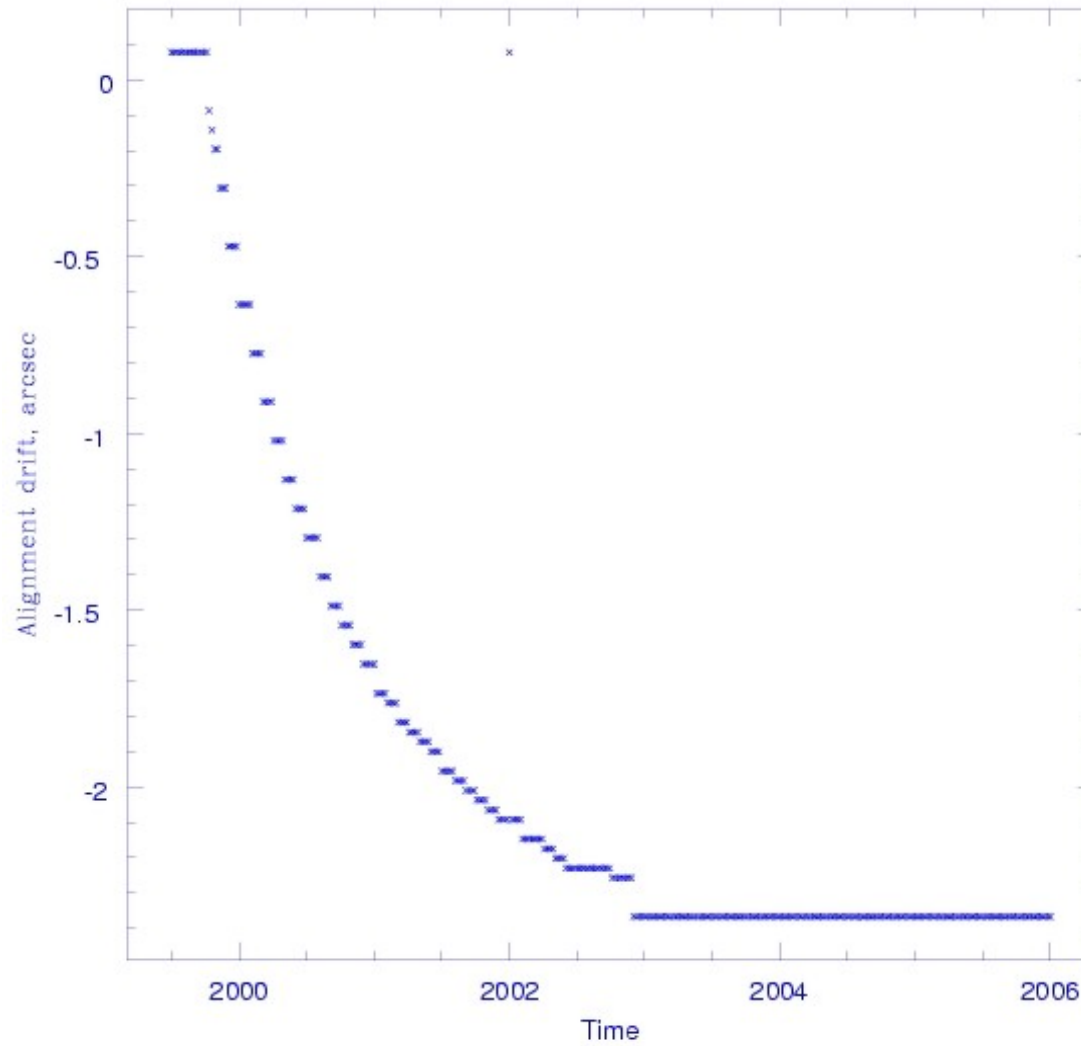# Aimpoint variation on orbital timescale
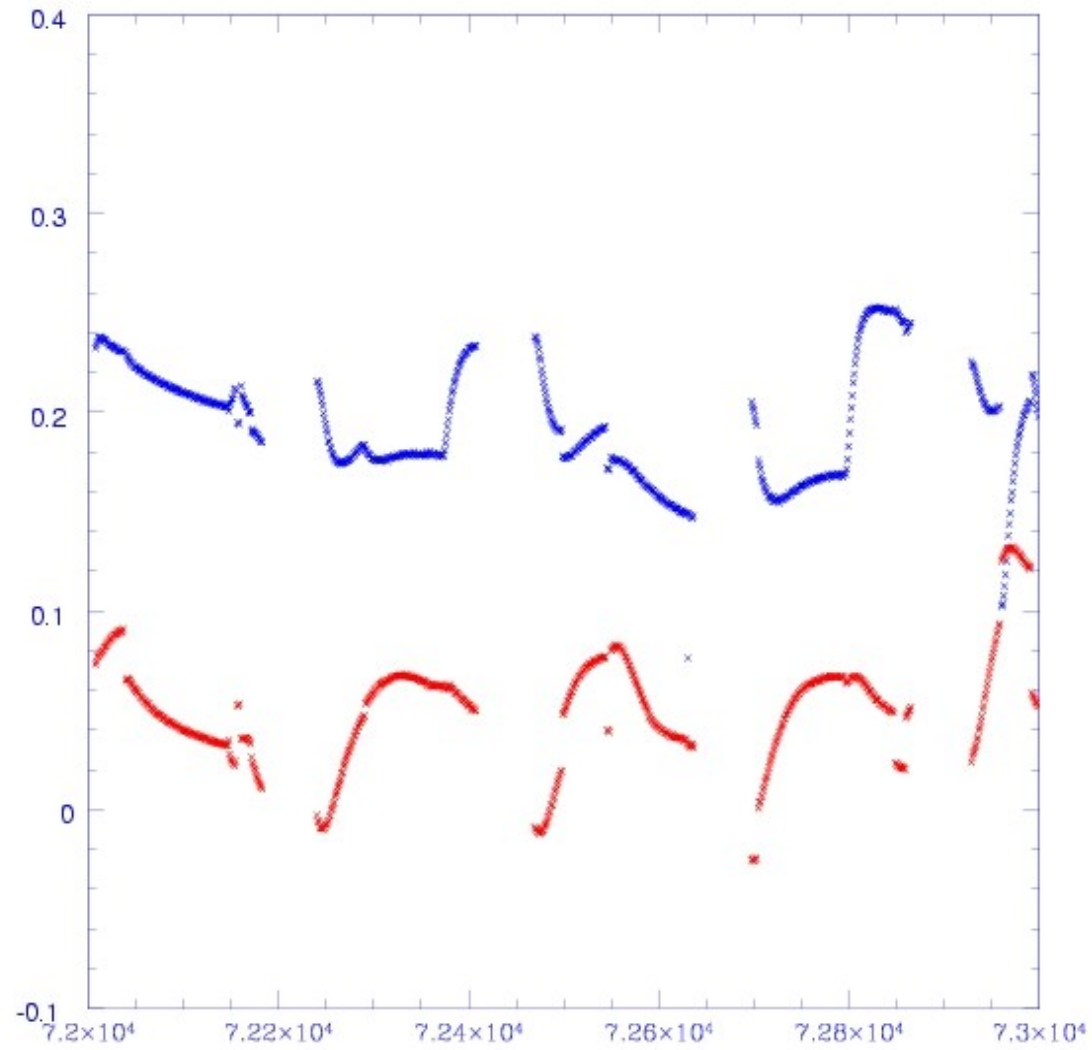
Fiducial drifts 1999-2005 (in mm, 1 ks averages)

1 ks averages for fiducial drifts

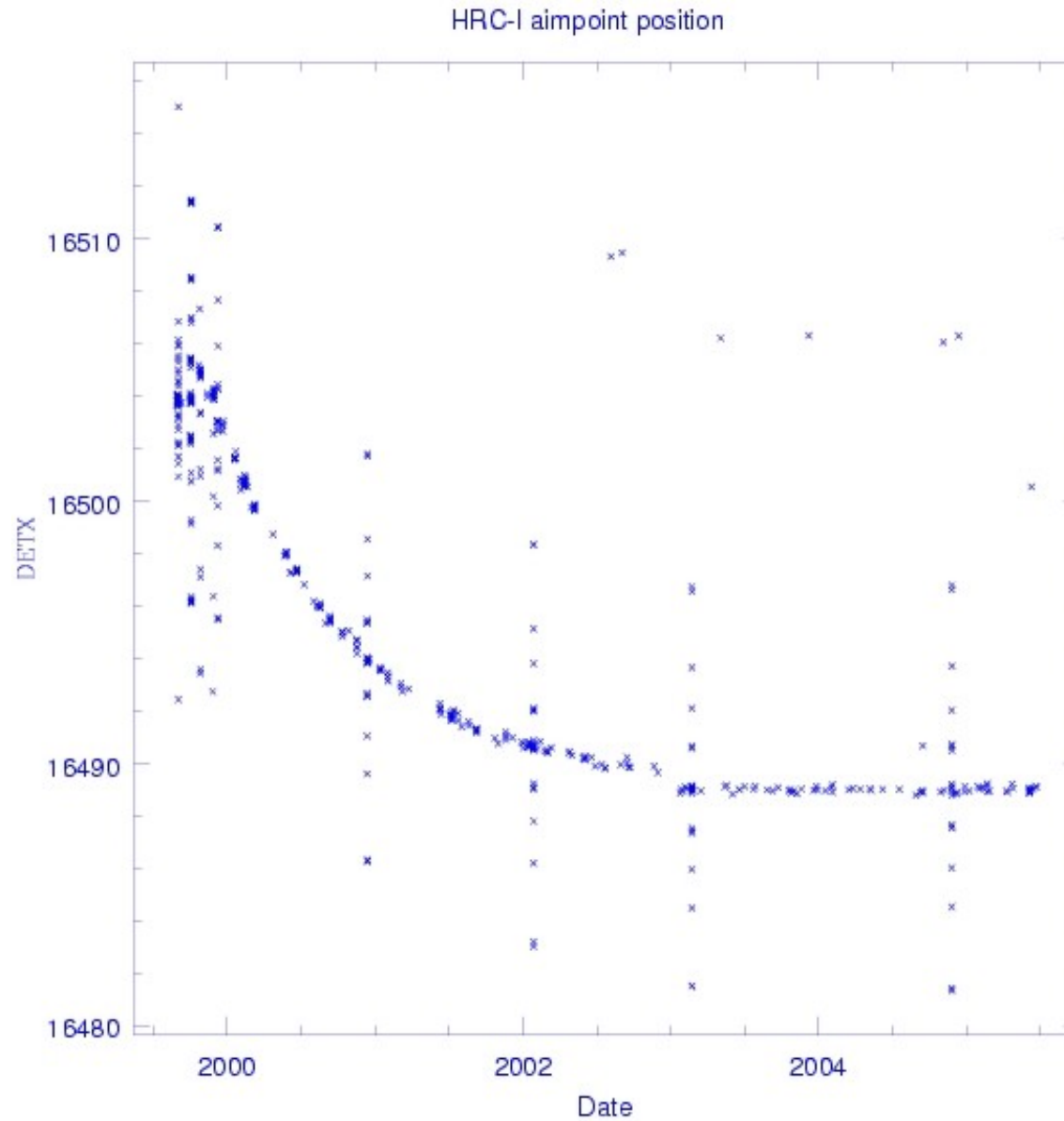# Fiducial drifts, time averaged and separated by instrument

Time-averaged FID offsets

The CALALIGN matrix: 2" drift 1999-2004

Aimpoint motion in detector coordinates
(due to CALALIGN changes)

HRC-I aimpoint position

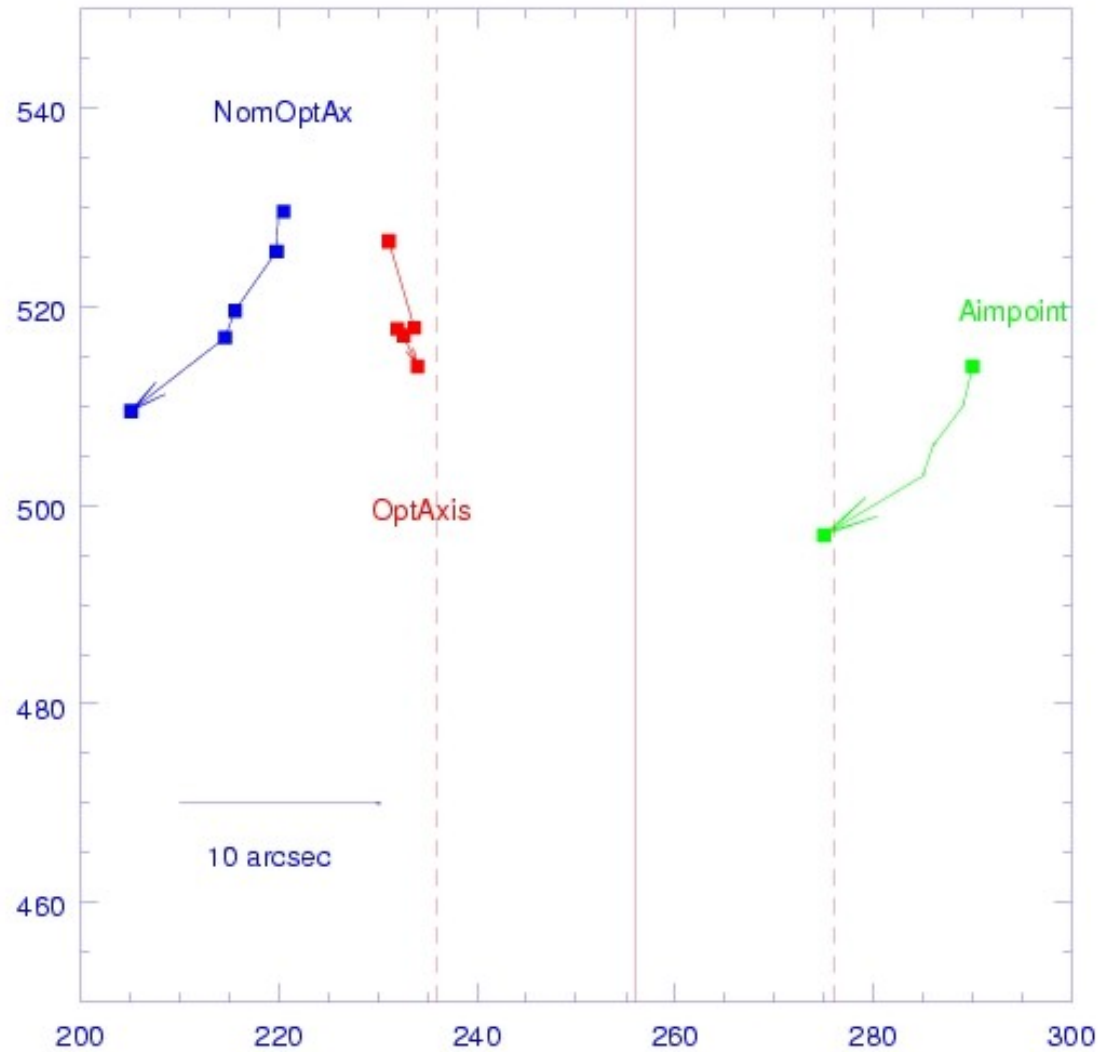# Aimpoint and optical axis motion in HRC-I coordinates
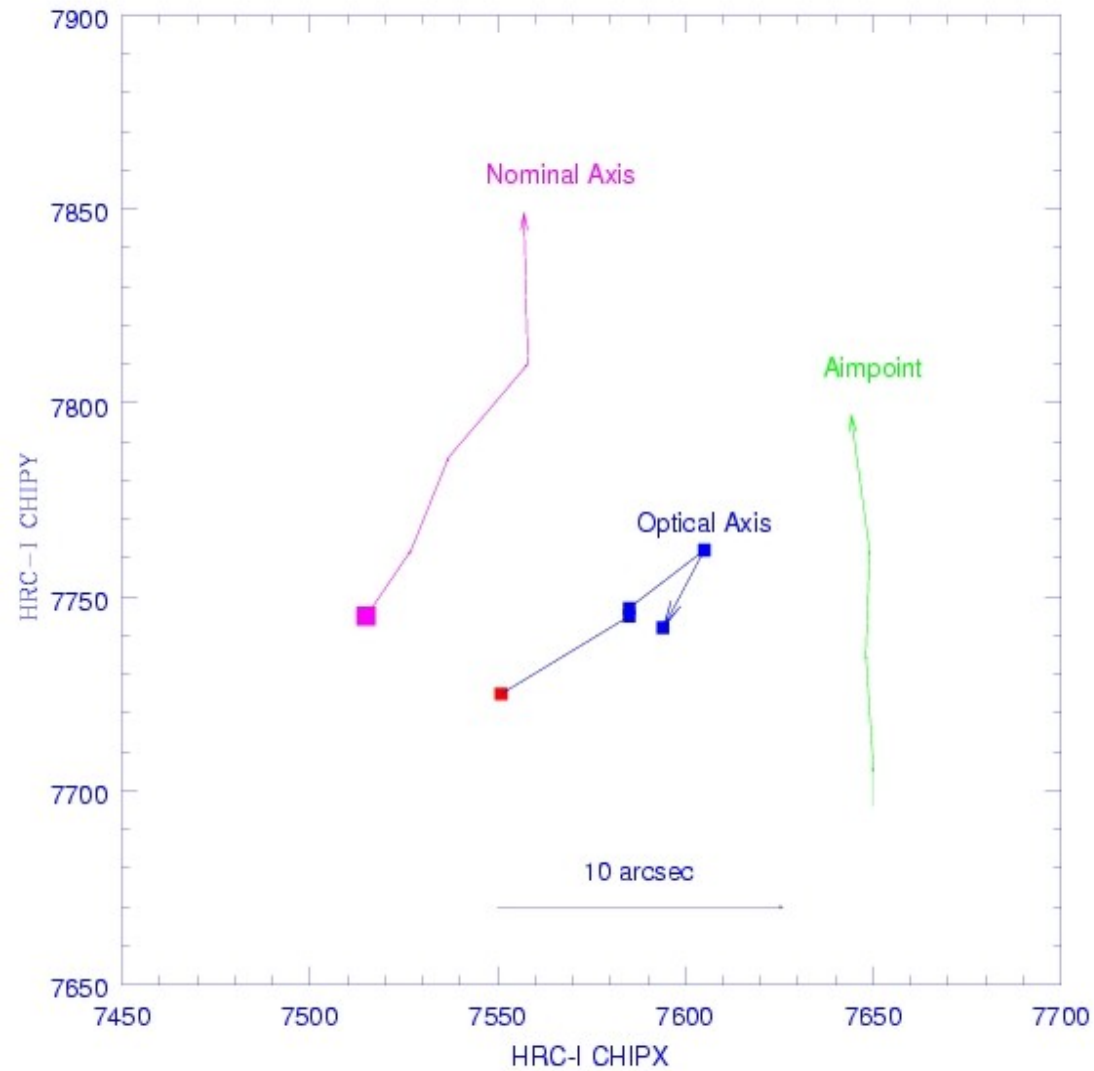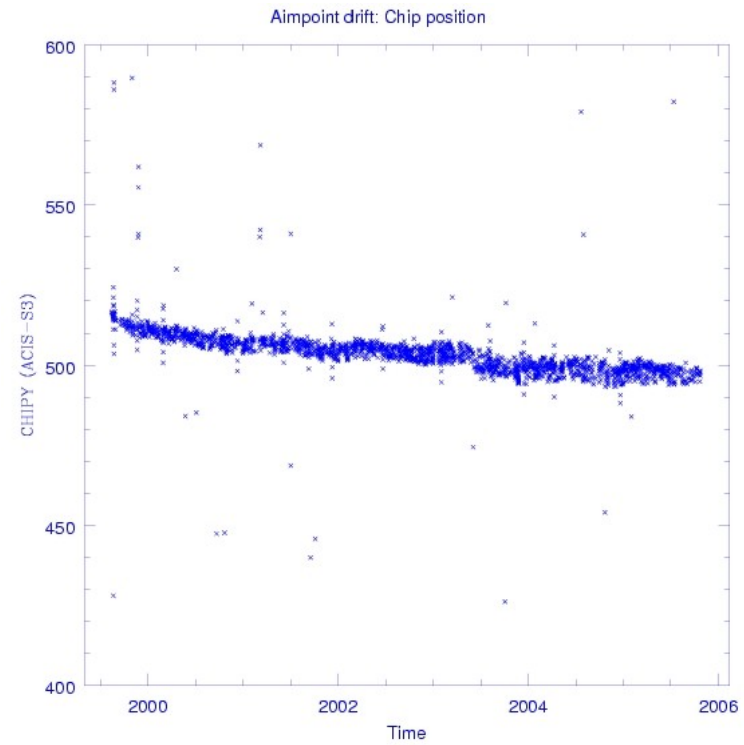
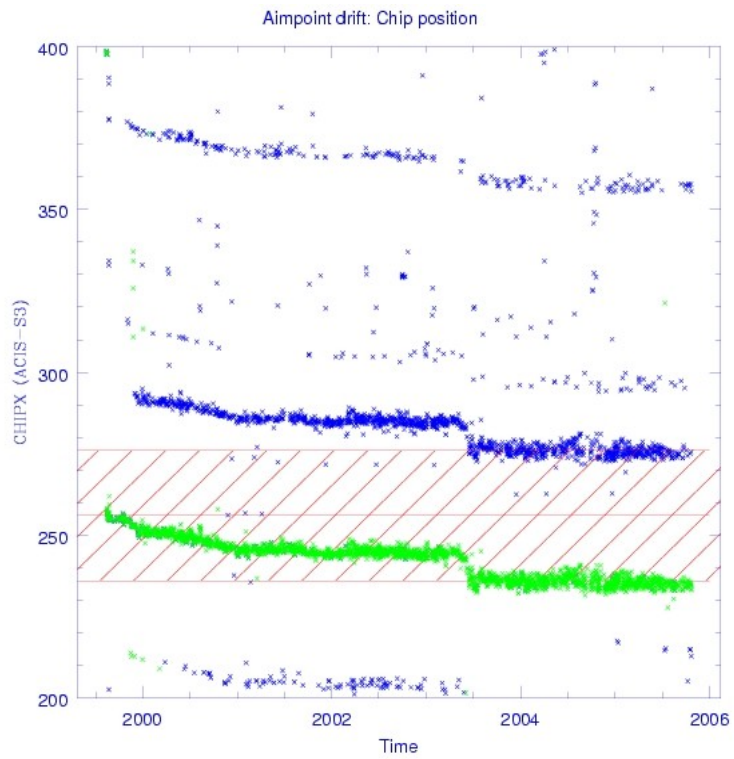# Aimpoint and optical axis motion in detector coordinates
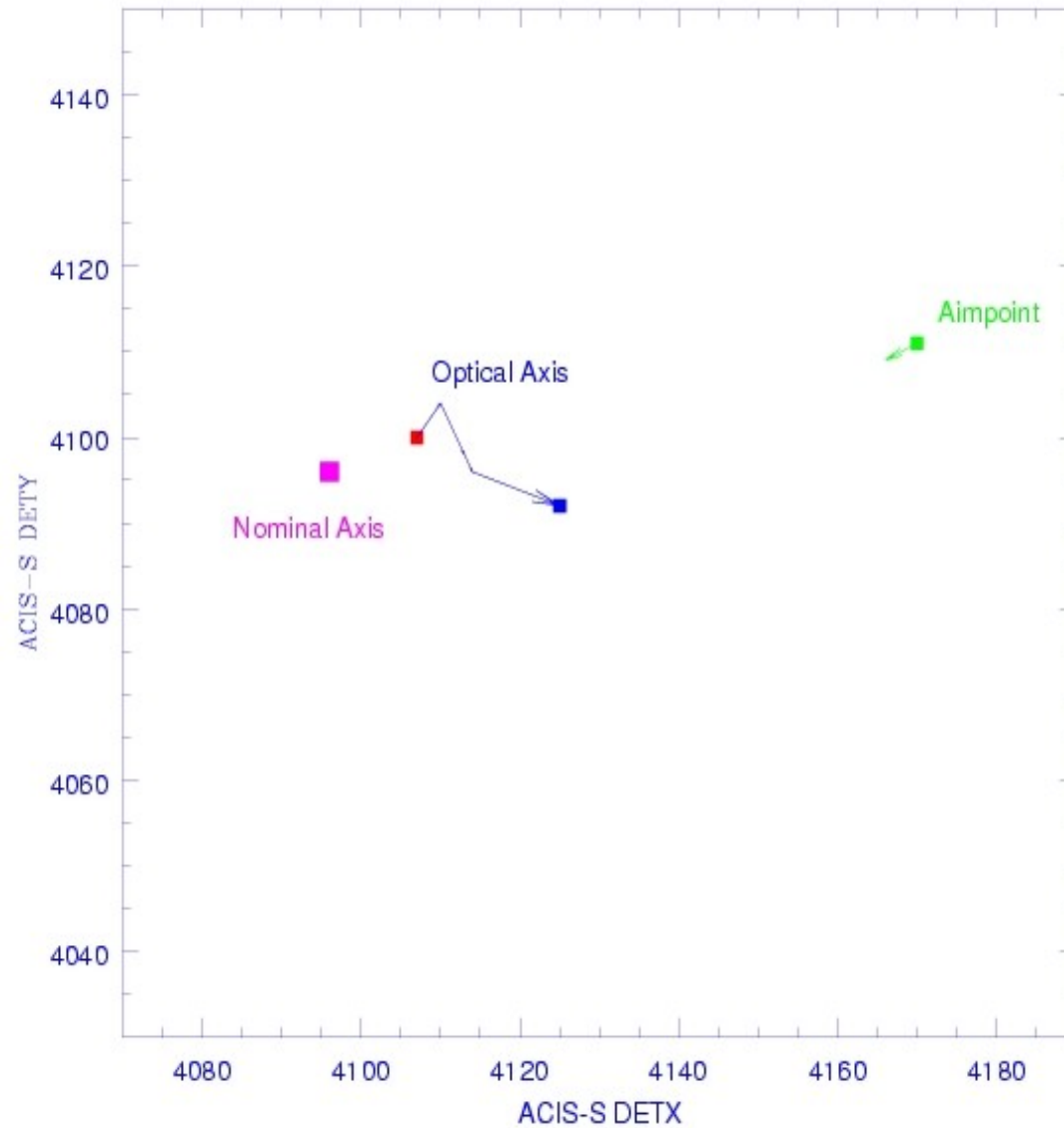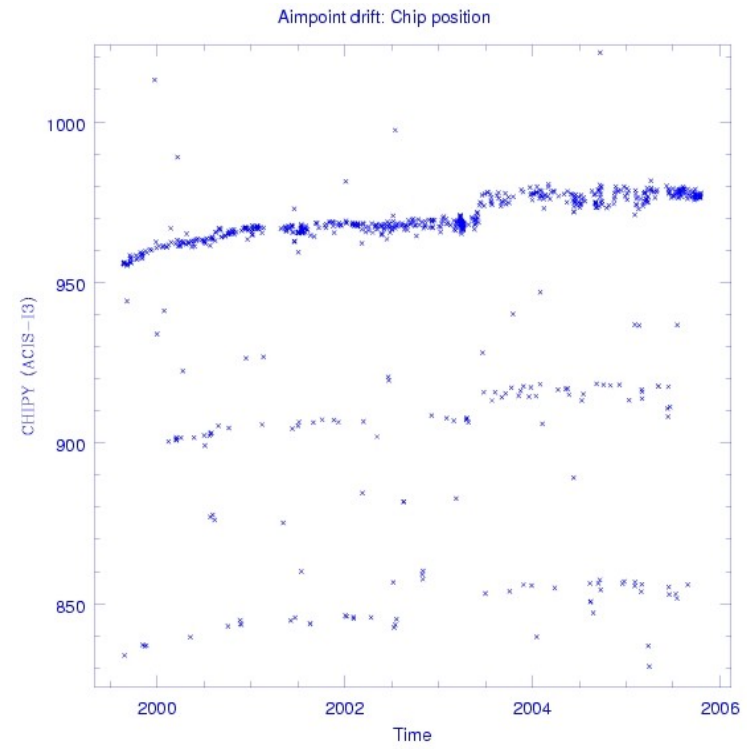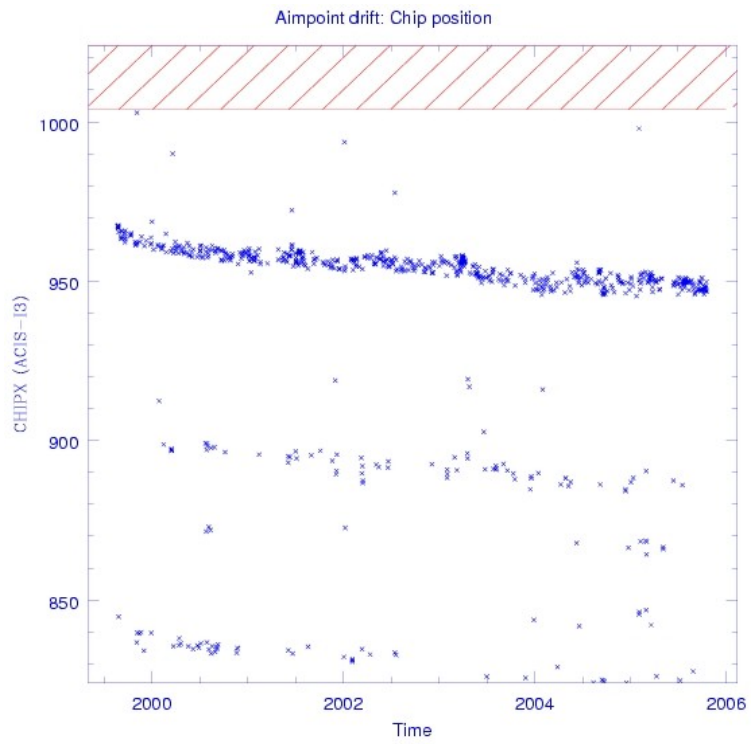
Aimpoint and optical axis motion on ACIS-S

Drifts on S3

Aimpoint motion on ACIS-S

Aimpoint motion on ACIS-I

SUMMARY

- ACA to SIM boresight has drifted by about 12-15 arcsec since launch

- Aimpoint fixed in ACA frame has therefore moved

- ACIS-S zero-offset aimpoint near node 0/1 boundary

- -20 arsec offset now also near boundary

- Recommend default +10 arcsec offset instead