

# XMM-Newton CCF Release Note

XMM-CCF-REL-0099

## EPIC PN Astrometry

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### 1 CCF components

Name of CCF	VALDATE	List of Blocks changed	CAL VERSION	XSCS flag
XMM-BORESIGHT_0016.CCF	2000-01-01T00:00:00			NO

### 2 Changes

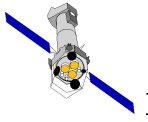
Based on a statistical analysis of correlations of pn sources with with USNO stars in the field-of-view of 349 pointings, a residual of **0.3 degree** in pn was found, by J. Tedds and M. Watson (SSC).

Reference : **Aboslute astrometry of XMM-Newton fields: *eposcorr* results**, SSC-LUX-TN-0060 Techincal Note , issue 1.0, Date: 13 Nov. 2001 that can be found at : <http://xmmssc-www.star.le.ac.uk/pages/pubdoc.shtml>

This was translated into a correction 0.3 degree of the EULER\_PSI rotation angle in the 3-2-1 rotation boresight matrix, which describes the misalignment of the respective instruments with respect to the satellite coordinate frame. The PN EULER\_PSI angle has therefore been updated from -5.4326213896274678E-04 to 4.692730000000000E-03 radian.

### 3 Scientific Impact of this Update

This new CCF shall bring a better accuracy for PN images, correcting the pn source positions up to 3-4 arcsec in the towards the very edge of the field-of-view (but much less towards the centre).



## 4 Estimated Scientific Quality

With this new BORESIGHT CCF the sky positions of XMM sources are believed to be consistent between the 3 EPIC cameras to better than **1-2 arcsec** across the whole field-of-view, without applying any additional shift.

This doesn't prevent that a global shift - but no field rotation - of the MOS and PN images be applied, to get absolute astrometry via correlations with external catalogues.

Note that the amplitude of this shift can be up to 4 arcsec but with a r.m.s. of the fluctuations of only 2 arcsec (again see SSC-LUX-TN-0060 for more details). It is believed to be due either to a limited accuracy of the reconstructed attitude as provided by the star tracker (e.g. dependence on the position of the guide star in the STR CCD because of field-of view distortion that could be corrected in principle in the future) or by thermal deformations between the telescope tube and the star tracker.

## 5 Expected Updates

## 6 Acknowledgements

Jonathan Tedds and Mike Watson for their extremely useful work on EPIC astrometry.