The Survey Science Centre report to the XMM-Newton Users Group

Natalie Webb
Topics

- SSC status
- SSC activities
- The 3XMM catalogue
- Development
- Future plans
- Summary
SSC status

• No major evolution in status since the 2015 Users Group meeting
• Regular teleconferences with the 9 SSC points of contact
• Consortium meeting held March 2016 in Santander, Spain
• Continued SAS task development + support
• Continued input into pipeline development via monthly SAS-CCB meetings
• Continued data products screening
• Ongoing source identification activities
• Enhancement of catalogue servers
SSC status

20 years of the SSC!
What we have achieved over the last 20 years

- Good quality software to reduce all XMM-Newton data
- Reliable pipeline to reduce XMM-Newton data automatically
- Provided the biggest catalogue of X-ray sources from a single observatory
- Provided a complimentary catalogue of ultra-violet and optical sources
- Provided repositories and databases in which to search and exploit the catalogue data and multi-wavelength follow-up data
- Produced a series of well cited papers
### 3XMM-DR6

**Publication date expected: 5th July 2016**

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The XMM-Newton serendipitous survey

VII. The third XMM-Newton serendipitous source catalogue


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ABSTRACT

Context. Thanks to the large collecting area ($3 \times 1500$ cm$^2$ at 1.5 keV) and wide field of view (30$'$ across in full field mode) of the X-ray cameras on board the European Space Agency X-ray observatory XMM-Newton, each individual pointing can result in the detection of up to several hundred X-ray sources, most of which are newly discovered objects. Since XMM-Newton has now been in orbit for more than 15 yr, hundreds of thousands of sources have been detected.

Aims. Recently, many improvements in the XMM-Newton data reduction algorithms have been made. These include enhanced source...
Catalogue access

http://xmmssc.irap.omp.eu

Access from 108 countries worldwide
Catalogue access
## Catalogue access

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</table>
SSC catalogue servers

XcatDB Content [Data access by clicking either on or on ]

- Possible identifications of all EPIC sources in archival catalogs.
- 3XMM Slim catalog of unique sources with possible identifications in EPIC spectra, EPIC time series and other useful previews.
- Optical Finding Charts.

Additional Data and Features

- XMMFITCAT spectral fits (A.Coral et al.) can be accessed from the X-ray page. Only the simple models fitted on DR4 spectra are supported yet.
- Online spectrum fitting Select sources with spectra click on below any choose the model and submit. The back-end runs Xspec-python.
- Search by region (Individual detections only) Open the query editor on th

The 3XMM-dr5 XMM-Newton catalogue

Arches project benefitted XCatDB

XMM-Newton Users Group 7th - 8th June 2016, ESAC Natalie Webb, IRAP, Toulouse
Under development

Source detection on stacked observations currently undergoing testing

Aims:
▷ provide a standardised source-detection method for overlapping observations
▷ more convenient handling of multiple pointings for the user
▷ optimise stacked source parameters
▷ potential basis of a “stacked catalogue” of repeatedly observed sources
Source detection on stacked images: The testing phase

Stacking images with emldetect

Simultaneous PSF fitting:
- combine each image with the corresponding exposure map,
  background map,
  and detection mask
- fit all valid images per detection
- PSF chosen per image (position)
- fit parameters: position, extent, counts
Catalogue from stacked source detection could be produced this year

Offshoot – improved background subtraction methods developed, based on adaptive smoothing

- significantly fewer spurious detections
- fainter sources can be detected
Future plans

To date the variable sky has not been significantly exploited with XMM-Newton

New tasks could be put into the pipeline to identify new variable sources in the field of view

With PIs prior accord, the coordinates of a new variable source could be made public (automatically)

Could help with following up gravitational wave detections - but also find new tidal disruption events, etc
Summary

Continued SAS task development + support

Continued data products screening

Ongoing source identification activities

3XMM-DR6 expected for next month, 3XMM-DR7 for next year

Stacked source catalogue expected this year

Enhanced catalogue servers helping to disseminate data products

4XMM, using new methods and upgraded products expected in 2019
Thanks to strong support from SSC members and the SOC, we are continuing to provide XMM-Newton legacy products to the astronomical community.