# catprep

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**Abstract**

Catprep reads an OBSMLI file to read the pointing position, then extracts from SDSS, 2MASS, and USNO catalogues all sources in the XMM field-of-view. These are written to 3 tables in a FITS file ready for catcorr.

# 1 Instruments/Modes

| Instrument | Mode |
|---|---|
| EPIC | Imaging |

# 2 Use

| | |
|---|---|
| pipeline processing | yes |
| interactive analysis | no |

# 3 Description

Task `catprep` reads an OBSMLI file simply to find the RA and declination of the centre of the field. It then accesses three standard catalogues and extracts data for sources in the XMM EPIC field of view. These are written to a single output FITS file, one table per catalogue. If the SDSS catalogue has no sources in the field the table is created but with zero rows.

## 3.1 Reference catalogues

- USNO-B1: the US Naval Observatory catalog contains just over one billion objects from measurements of Schmidt plates taken at various observatories over the past 50 years. It covers the entire sky.

- 2MASS: the Two Micron All Sky Survey, conducted by CalTech using telescopes in Arizona and Chile. The catalogue covers the entire sky, and contains about 600 million objects with a typical positional accuracy of 0.5 arc-seconds. The main value of 2MASS in this context is at very low galactic latitudes.

- SDSS: the Sloan Digital Sky survey data release 8 - positions extracted from the photoPrimary table to a set of text files at Leicester using SQL scripts. This has the deepest sky coverage but only about one third of the sky is covered. When an XMM field is covered by SDSS, its goodness of fit value is almost always the largest.

The paths to these three reference catalogues have now to be set in the following three environment variables

- UB1_PATH for the USNO catalog

- TWOMASS_PATH for the 2MASS catalog

- SDSS_PATH for the Sloan catalog.

An additional test script /test/test_cat_access.csh is now added, which sets these three environment variables to the cat_data subdirectory of /test/. The small set of files tested by the input file P0005010301EPX000OBSMLI0000.fits have been put in this subdirectory. A more extensive test would involve changing these environment variables to paths depending on the local software environment.

# 4 Parameters

This section documents the parameters recognized by this task (if any).

| Parameter | Mand | Type | Default | Constraints |
|---|---|---|---|---|

| srclistset | yes | dataset | | |
|---|---|---|---|---|

File name for the FITS file of type OBSMLI containing a binary table of X-ray source positions and their errors. This may be a compressed file as it is just accessed read-only.

| catextract | no | dataset | catextract.ds | |
|---|---|---|---|---|

File name for the output FITS binary table containing extracts from the three reference catalogues.

# 5 Errors

This section documents warnings and errors generated by this task (if any). Note that warnings and errors can also be generated in the SAS infrastructure libraries, in which case they would not be documented here. Refer to the index of all errors and warnings available in the HTML version of the SAS documentation.

**missingKeyword** *(error)*
    missing FITS header keyword

**catWriteExtracts** *(error)*
    error creating file

**twomassRead** *(error)*
> error opening twomass file

**twomassRecord** *(error)*
> error reading record

**twomassSize** *(error)*
> twomass-read: too many data points

**twomassSearch** *(error)*
> error finding record

**usnoRead** *(error)*
> error opening USNO file

**usnoRecord** *(error)*
> error reading USNO record

**usnoSize** *(error)*
> USNO too many data points

**usnoSearch** *(error)*
> error finding record in USNO

**fitsioError** *(error)*
> The message indicates the location of the error in the software, but it is likely to be a defect in the FITS structure which is the cause.

# 6 Input Files

1. An OBSMLI file or other data type containing header keywords RA_PNT and DEC_PNT.

# 7 Output Files

- Catalogue extract: a FITS file containing extracts for the current field of view from the reference catalogues, respectively SDSS, 2MASS, and USNO. Each extract is in a separate HDU. If the SDSS survey did not cover the relevant part of the sky the HDU still exists but will have zero rows. The other two catalogues have all-sky coverage so this should not happen. The format of this file is documented in task catcorr, which it is designed to read it.

# 8 Comments

# 9 Future developments

TBD.

# References