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SSC XID WWW pages and Databases at IOA

Issue	Author	Date	Comment
1.1	S. Aigrain	2001 January 28	Draft Issue
1.2	S. Aigrain	2001 February 14	Tables sorted by PHP

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1 Summary

This document contains information describing the databases and WWW pages produced for the SSC XID program.

The WWW pages are in:

http://www.ast.cam.ac.uk/~xmmssc/xidops/

Contents

2 WWW design issues and experiences

The WWW pages are currently maintained using PHP 4. One ASCII file containing a list all fields and corresponding data is read by a PHP script which generates a clickable table and calls subroutines to create index pages for each field.

2.1 Main XIDOPS table

For the fields for which XID source lists are available, a table containing information about the location of the data files and links to available matching tables and plots is created:

http://www.ast.cam.ac.uk/~xmmssc/xidops/fields_status.php

Data that is processed is represented by a green ball, absent data by a red one and data that has been taken but not processed by an orange one. By pointing the mouse on a ball, one can view the location of the corresponding file.

The table contains the following fields:

- Field name with link to field index page
- RA, DEC and galactic latitude of field
- List of XMM source lists (link to index page for that list) with list of included bands
- XMM images (I am not sure these ranges are correct):
  - 0.2 to 0.5 keV
  - 0.5 to 2 keV
  - 2 to 4.5 keV
  - 4.5 to 10 keV
  - band labeled '57'
- APMCAT source list
- DSS images:
  - 1st generation red-band
  - 2nd generation red-band
  - 2nd generation blue-band
- WFC data: link to quality control plots if available, location of merged source list, run numbers for each band:
  - i-band
  - z-band (or Z-band)
  - r-band

    - g-band
    - U-band

- CIRSI source list and image

Lockman Hole data is not included in this table, as it is part of a separate project. Neither are any fields for which no XMM data has been collected yet. A separate table containing the same information for the Lockman Hole field is available here:

http://www.ast.cam.ac.uk/~xmmssc/internal/lockman-hole/ lockman-hole.php

A separate, publicly accessible table has been created at the following location:

http://www.ast.cam.ac.uk/~xmmssc/xid/data_status.php

Every field is shown in this table, including the Lockman Hole, but no X-ray information is shown (*i.e.* all the fields in the list above relating to XMM images or source lists have been removed). When available, a link to WFC data quality control plots is provided.

2.2 Creating index pages for each field

PHP has been identified as the most sensible way of automatically updating links to matching tables and plots when data is added or modified. Although perhaps not as powerful as some other methods it is quick to develop.

Currently the input ASCII file is read only once by the program FIELDS_STATUS.PHP which creates the table described in the previous section. Programs to generate all other pages are called within FIELDS_STATUS.PHP, which make the loading of the main table slow.

This could be avoided in a number of ways (see section 2.5).

2.3 Organisation of the WWW index pages for each field

For each field the following WWW pages exist (provided the relevant data is available)

- Field index page (created by MK_FIELD_INDEX.PHP). Contains links to WFC quality control plots index and index pages for each XMM source list
- WFC quality control plots index pages (created by MK_WFC_INDEX.PHP) with links to colour-colour plots, differential magnitude, ellipticity and position angle histograms and spatial distribution plots
- Index page for each XMM source list (created by MK_HTML_INDEX.PHP) with links to the XMM/WFC/CIRSI and XMM/APM matching table and a number of plots involving XMM and other data. This includes colour-colour plots of WFC and APM data where the objects with identifications in the X-ray bands are highlighted, as well as likelihood ratio histograms

2.4 Storing and presenting the XID results

At first, once the matching process was performed in IDL, the same program went on to write a HTML table sorted according to a user–specified column. This was however inefficient and required the matching to be repeated each time a different sorting order was required. The output of the

IDL matching program is now an ASCII table (which is also useful in that it can be put to a variety of uses). The 'HTML_INDEX' page then contains a link to a PHP script which reads, sorts and displays the ASCII table (the user still specifies the sorting column), rather than a link to a choice of HTML tables sorted in various ways. There is also a direct link to the ASCII file (in fact, two ASCII files, one with whitespace separator and one with comma separators) from the 'HTML_INDEX' page.

No additional time is taken downloading the main XIDOPS table as the PHP sorting sorting script is only called when required.

2.5 Remaining issues

With the current set-up the entirety of the index pages is re-created whenever the main XIDOPS table is down-loaded. The reason for this is that the PHP script creating the main table reads in the input text file and calls the subsequent scripts, which do not have to read it again. If an index page was only updated when needed, the input text file would have to be re-read every time, slowing down the process a lot. An compromise might be to read the text file into a database (*e.g.* MYSQL or Sybase) from which information could be extracted by each PHP script. However, the temporary solution we have adopted was to add a 'no_update' option to FIELDS_STATUS.PHP. If it is selected, the index pages are not updated. The Sybase option is currently under investigation as a smaller database is being created containing quality information for WFC data (seing, sky, *etc.*).

The PHP scripts only create links to existing html pages or plots, they do not create any custom made plots and the user can only specify the sorting order in the tables, not the columns they want or, for instance, a Likelyhood Ratio cutoff for matches. For some of the table or plots it would be of interest to allow the user to request specific aspects. This is currently under investigation.

3 Directory structure: where the data is stored

Both input data files and output generate through XID work are stored in:

/data/cass101a/xmmssc/public_html/

They are then linked to from the xmmssc home directory using symbolic links. Publicly available data (*i.e.* the WFC quality control plots) are found in:

/home/xmmssc/public_html/xid/

while the input data files and XMM-specific output are in:

/home/xmmssc/public_html/xidops/

The entire structure is described in Appendix 1.

The following sections describe the contents of the directories shown in Appendix 1 as they are named in the xmmssc home directory.

3.1 Input files

These are found in:

/home/xmmssc/public_html/xidops/.

- For each field there is a directory **field** within which all the following are found:
  - xmmssc: XMM source list(s) and XMM images
  - cirsi: CIRSI source list and image if available
  - wfc: WFC unmerged source lists (1 per band per CCD), images (1 per band) and merged source lists (1 per CCD).
  - dss: APMCAT source list and DSS images (1^{st} generation red, 2^{nd} generation red and blue)

3.2 Output files

By output files, we imply all files created in the XID process. For each field, the following organisation is followed:

3.2.1 XMM SSC access only

These are found in:

*/home/xmmssc/public_html/xidops/***field**.

- index.html: field index page generated by PHP.
- dbase: contains all database files. Each source list (XMM, WFC, CIRSI, APMCAT) is read into an IDL database before any matching or quality control work.
- For each source list there is a directory **source_list** within which the following are found:
  - txt: ASCII files generated in the matching process and used for the creation of individual object pages.
  - html: Contains all the following:
    - index.html: created by PHP script.
    - xmm_*_sort**.html where * is 'wfc', 'apm' or 'cir' and ** is 'ra', 'i', 'h', 'f52' or 'f41': matching tables.
    - ***_apm.html, ***_wfc.html where *** is a number: individual object pages.
    - apm: contains plots of XMM 0.5 to 2 keV flux vs APM red-band magnitude.
      - colplots: contains colour-colour or colour-magnitude plots of APM objects matched with XMM sources, with html index page generated by PHP.
    - gif: contains gif cut outs of all available images (XMM, WFC, CIRSI, DSS) around the position of each XMM source on the list.
    - match: contains offset histograms for each set of matches (XMM / CIRSI, XMM / WFC, XMM / APMCAT).
    - wfc: contains plots of XMM 0.5 to 2 keVflux vs WFC r-band magnitude.
      - colplots: contains colour-colour or colour-magnitude plots of WFC objects matched with XMM sources, with html index page generated by PHP.
      - lhr: contains histograms for the likelihood rtio analysis of the XMM / WFC i-band matching.
    - xmm: contains cumulative histograms of XMM flux in all available bands and hardness ratio plots.

3.2.2 Public access

These are found in:

*/home/xmmssc/public_html/xid/***field**.

- wfc_quality_control.html: index page generated by PHP.
- colplots: contains colour-colour or colour-magnitude plots of all WFC objects overlaid with synthetic star and QSO data.
- diffmag: contains differential and cumulative histograms of WFC magnitudes for each available band.
- dotplots: contains plots of spatial distribution of WFC objects on the image, overlaid with the CCD boundaries.
- ellip: contains differential and cumulative histograms of ellipticities for each available band.
- posangle: contains differential and cumulative histograms of position angles for each available band.
- stat: contains plots of 'statistic' (as found in the WFC input FITS files) versus core magnitude for each available band.