

XMM documentation and proposal preparation tools

M. Dahlem

European Space Research and Technology Centre (ESTEC), Space Science Department,
Astrophysics Division, Postbus 299, NL-2200 AG Noordwijk, The Netherlands

ABSTRACT

I introduce the XMM SOC's web server as the primary source of information on XMM, with particular emphasis on those parts that assist XMM users in the proposal preparation phase: The XMM Users' Handbook (UHB), the Call for Proposals (AO-1), the XMM Target Visibility Tool and the XMM Science Simulator (SciSim). The HTML version of the UHB is introduced as the document linking all other sources of information together.

1. Introduction

All XMM publications pertaining to the preparation of observing proposals are made available online. Therefore, the first thing to do in order to obtain information about XMM and how to conduct observations with it should be to check out the web server of the XMM Science Operations Centre, at the URL <http://astro.estec.esa.nl/XMM/>. A screen shot of the XMM home page is presented in Fig. 1.

Latest updates of the XMM web server are always posted under "Latest News", at the URL http://astro.estec.esa.nl/XMM/news/news_top.html and the date of the latest posting is always displayed on the home page. Therefore, reading the Latest News should be the first step to explore our web site. Everybody interested in email notifications about XMM-related news should subscribe to our mail list server by sending an email to xmm-news-request@astro.estec.esa.nl, with the subject "subscribe" (without quotation marks).

All requests for help about XMM or questions should be directed to the XMM service account by email to xmmhelp@astro.estec.esa.nl.

2. The most important top-level items on the XMM web server

The most important information regarding XMM proposal preparation and submission is provided in the following documents:

1. Announcement of Opportunity (AO-1),

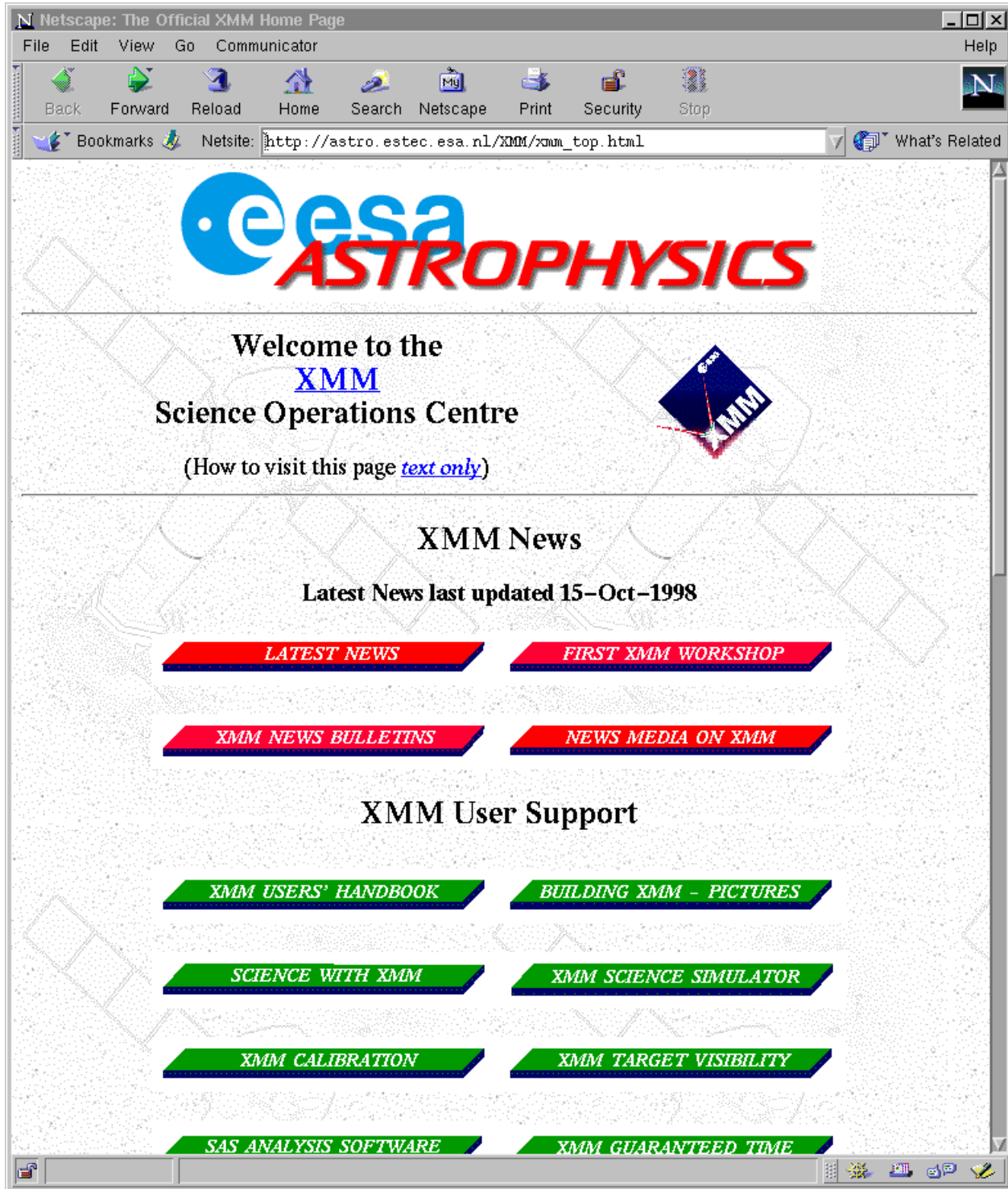


Fig. 1.— Screen shot of the top part of the XMM SOC home page. Latest News are posted under the top left button (in red). The Announcement of Opportunity (AO-1) will replace “News Media on XMM” soon. All other documents and/or tools listed in the text are available in the “User Support” section.

2. XMM Users' Handbook (UHB),
3. XMM Science Simulator (SciSim),
4. XMM Target Visibility Tool.

The following documents will soon be added:

5. XMM Remote Proposal Submission (RPS) Users' Manual (in preparation) and
6. XMM Data Files Handbook (in preparation).

These documents will be described briefly below.

2.1. Announcement of Opportunity (AO-1)

The first AO for XMM will be announced on November 16, 1998. The Call for Proposals will be accompanied by instructions for the proposal preparation and submission process. The relevant information will be posted at the URL http://astro.estec.esa.nl/XMM/news/AO/ao1_top.html.

2.2. XMM Users' Handbook

The first issue of the XMM Users' Handbook (UHB) was released on September 23, 1998. The document was created as a web-based information server linking transparently to various other components of the XMM SOC web server and other, external WWW sites. The online HTML version of the document always represents the most up-to-date description of XMM. It is available at the URL http://astro.estec.esa.nl/XMM/user/uhb/xmm_uhb.html. A screen shot of the top part of the UHB's first page is displayed in Fig. 2.

The XMM UHB uses "frames", dividing the display window of the viewer into four sections. In the top left corner, two click-on icons are available that link to the Astrophysics Division and XMM home page, respectively. The main frame, on the right, displays the selected pages of the UHB itself. In the bottom left frame the user always has the UHB table of contents available for easy maneuvering within the document. Further navigation buttons are available on the text pages themselves.

For the readers' convenience we offer two other versions of the XMM UHB for downloading and printing, namely PostScript (PS) and Portable Data Format (PDF). These are available via the XMM UHB introduction page at the URL http://astro.estec.esa.nl/XMM/user/uhb_top.html. Note that the PS file has a decompressed size of about 38 MB, which might make it difficult to print. When using `acroread` for viewing the

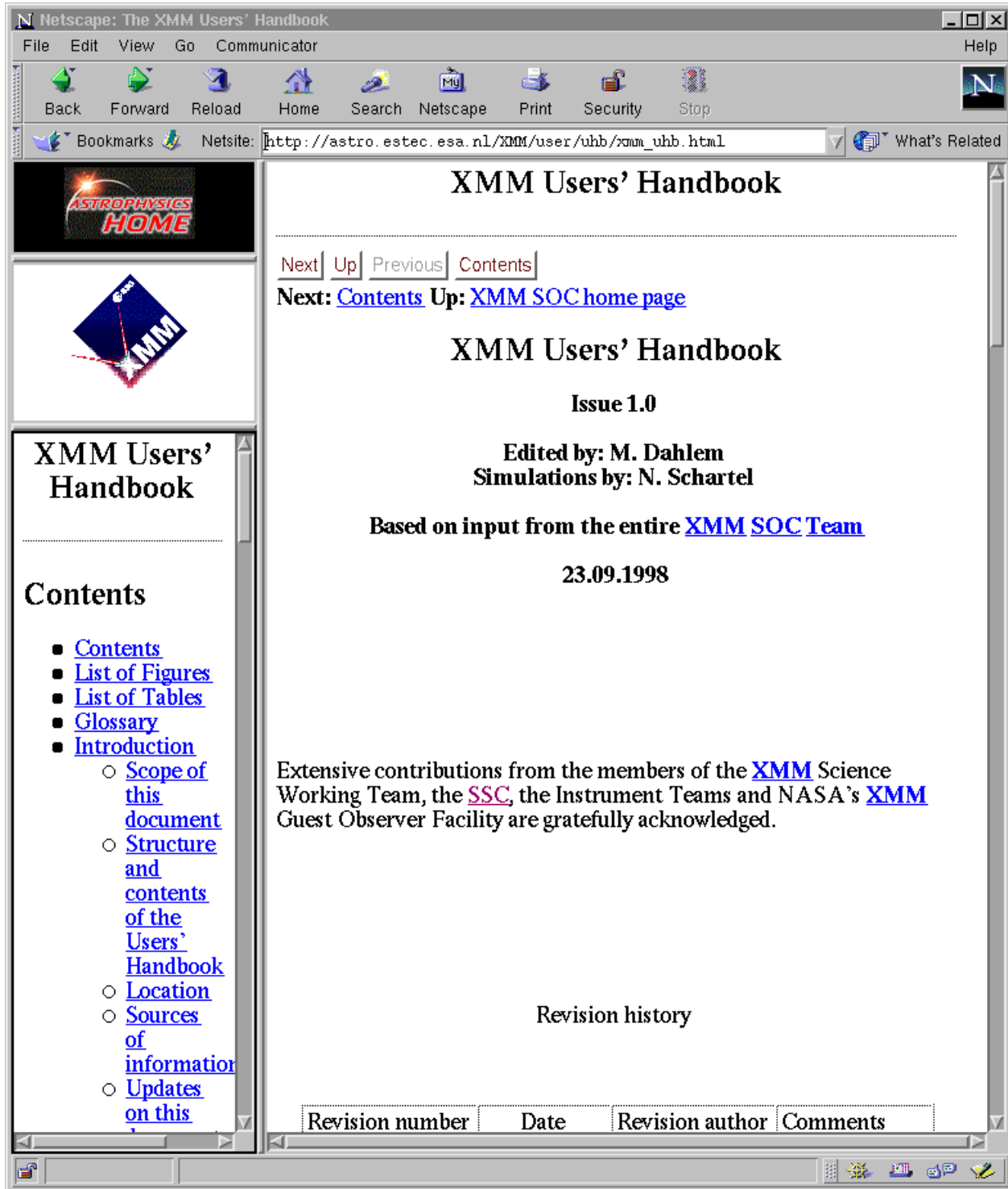


Fig. 2.— Screen shot of the top part of the first page of the XMM UHB. The three frames on the left can be used for maneuvering. The document itself is displayed in the right frame.

PDF version, please ensure that the “load fonts once” option is switched OFF for printing. It is also important to know that most figures are best viewed in full colour mode. Greyscale printouts will not in all cases have sufficient quality to show all details.

2.2.1. Status of the XMM UHB

The XMM UHB always reflects the best current knowledge of the satellite. Since this knowledge will increase with time, updates are expected to happen at regular intervals.

At present only very brief descriptions of the XMM Science Analysis Subsystem (SAS) software, XMM data products and the data archive are contained in the UHB, because all these components of the XMM Ground Segment are still under development.

The current version of the XMM UHB (issue 1.0) is still missing the following information, which will be added shortly:

- A list of XMM calibration (Cal) targets,
- a list of XMM performance verification (PV) targets,
- a list of XMM Guaranteed Time targets,
- links to the XRPS Users’ Manual and XMM Data Files Handbook and
- the links to the XMM AMS/PHS/RPS software are not alive yet.

2.3. XMM Science Simulator (SciSim)

The official tool for modeling XMM observations, developed by the XMM SOC, is SciSim. The software is available via the SciSim home page on our web server, at the URL <http://astro.estec.esa.nl/XMM/scisim/scisim.html>. It can be downloaded and executed on the user’s computer. SciSim-related topics can be discussed by subscribing to the SciSim mailing list, which is intended as a SciSim discussion forum.

SciSim can be used for different tasks, such as

- modeling XMM observations of targets with user-selectable emission characteristics and
- avoiding X-rays sources near the selected science target.

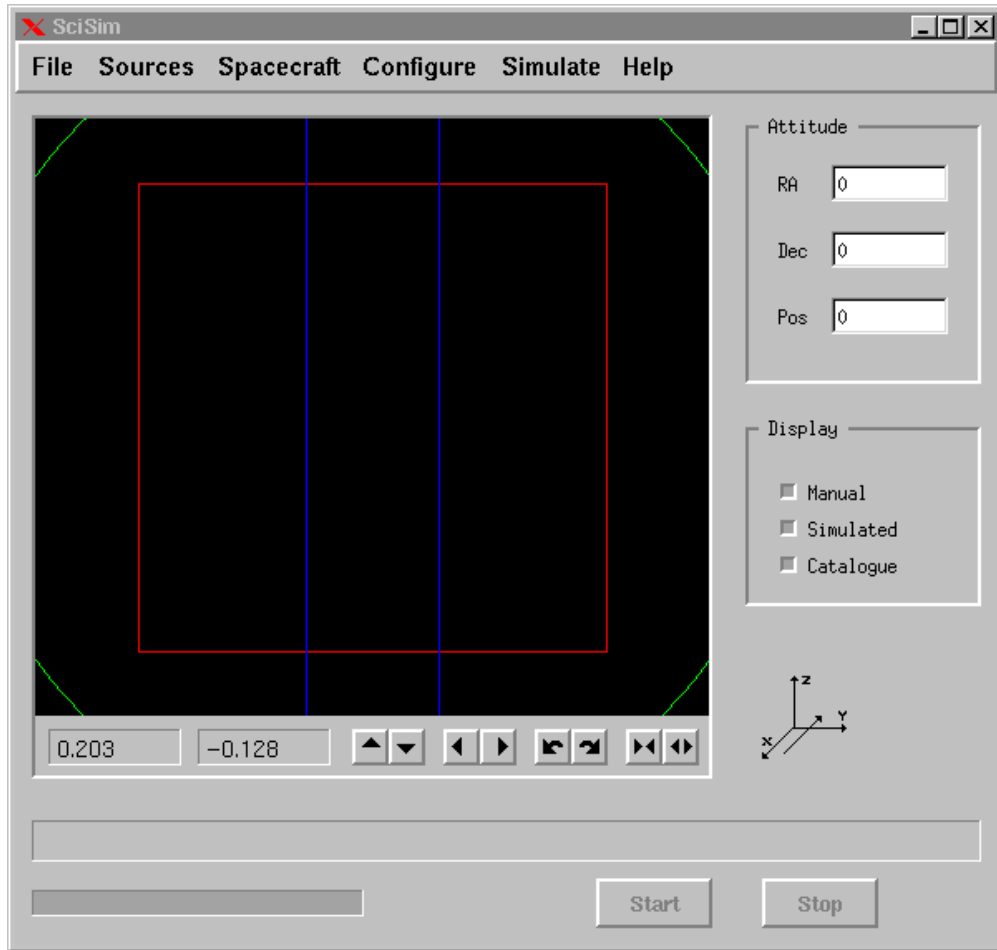


Fig. 3.— Screen shot of the top-level SciSim Graphical User Interface.

2.3.1. XMM spectral overlap avoidance

The avoidance of spectral overlaps in XMM Reflection Grating Spectrometer (RGS) observations can be tested in the following way. The SciSim Graphical User Interface (GUI; Fig. 3) displays a portion of the sky corresponding roughly to the field of view (FOV) of XMM’s X-ray telescopes. Using the menu item “Sources” one can specify coordinates and other properties of sources to be displayed. Two sources close to each other can be made visible in this way and their relative location with respect to each other within the FOV checked. The two parallel vertical blue lines mark the dispersion direction of the XMM RGS. Centering the FOV on the science target, the second source should then not fall in between those two lines in order to avoid spectral overlaps. If the second source should be located between the two blue lines, other satellite orientations for the planned observation can be tested by rotating the FOV, using the “Pos” variable on the right-hand side. This is the satellite position angle. By rotating the FOV, users can explore the

acceptable Pos range for the observations. These values can then be compared with the output of the XMM Target Visibility Tool (see below) to assess when the observations can be conducted.

2.3.2. *SciSim configuration*

SciSim runs can take very long to execute, in particular for bright sources (with high photon count rates) and long exposures. Therefore, users might not want to simulate observations of all instruments in parallel, but only specific parts of the XMM instrumentation, e.g., an RGS observation. For such purposes SciSim can be specifically configured. Fig. 4 presents the SciSim configuration GUI that is invoked by choosing the menu item “Configure” on the top-level GUI. As shown in Fig. 4 all instruments will be simulated. The file “tempc” contains source information, which is used fed into the Optical Monitor (OM) simulator and the chain of X-ray simulators, namely a ray generator (“RayGen”), the mirror modules, the Reflection Grating Arrays (RGAs) and the EPIC and RGS Focal Cameras (RFCs). For an RGS observation, e.g., the EPIC simulation can be switched off by clicking on the EPIC icon with the left mouse button; in the same way OM can be “switched off”. SciSim contains configuration files to ensure that only valid combinations of mirror module, RGA unit and RFC unit are used for model runs. Clicking on the icons with the middle mouse button, users can configure each component individually. However, overriding the default geometrical configurations is not recommended.

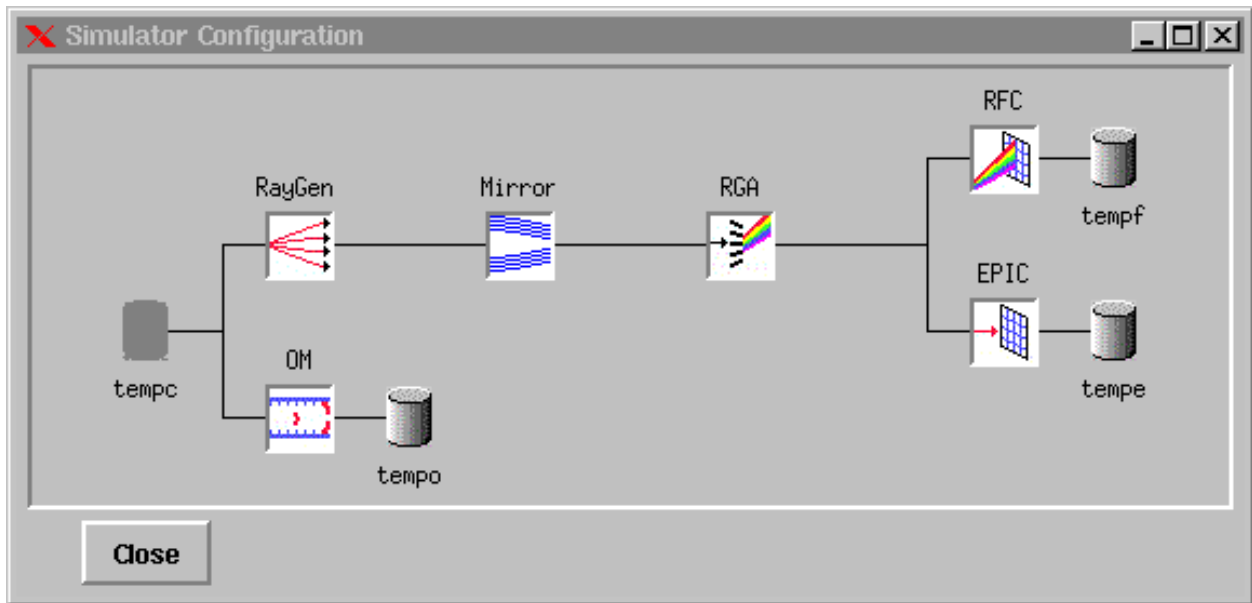


Fig. 4.— Screen shot of the SciSim configuration Graphical User Interface.

2.4. XMM Target Visibility Tool

XMM target visibility can be checked with the tool provided by us at the URL http://astro.estec.esa.nl/XMM/user/vis/vis_top.html. Running this tool for a certain target, users can find out during which XMM revolutions the source will be visible for a user-selectable minimum observing time. At the same time the nominal satellite position angle is provided for each of the orbits with target visibility (if any) as specified by the user. Comparing this angle with the one determined with SciSim (above) to avoid spectral overlaps tells the user when a time-critical observation (requiring a certain satellite position angle) can be conducted. A screen shot of the Visibility Tool interface is shown in Fig. 5.

Note: the tool still contains the old launch date. However, the new orbit has the same orbital parameters and therefore the target visibility for a given time with respect to the launch date should not change dramatically. Detailed visibility information depends on the exact launch date and time; definite values will therefore only be available after launch.

2.5. XMM RPS Users' Manual

The XRPS Users' Manual will describe in detail how to fill out the XRPS forms via a web interface and how to insert a postscript file containing the scientific justification for an XMM proposal. Standard recipes for default mode observations will also be provided.

This document is currently in preparation. It will be released at the same time as the software itself, on January 4, 1999.

2.6. XMM Data Files Handbook

The XMM Data Files Handbook is also still in preparation. It will describe exactly what kind of data the files delivered to observers, i.e., Observation Data Files (ODFs), Current Calibration Files (CCFs) and pipeline data products, contain. This document will be available some time in 1999.

3. Count rate conversion from other X-ray satellites

For the conversion of count rates observed previously with other X-ray satellites into expected XMM count rates the W3PIMMS is available at NASA's Goddard Space Flight Center, at the URL <http://heasarc.gsfc.nasa.gov/Tools/w3pimms.html>. Fig. 6 shows that XMM is one of the possible options. The calculations for XMM are based on calibration data provided by the XMM SOC.

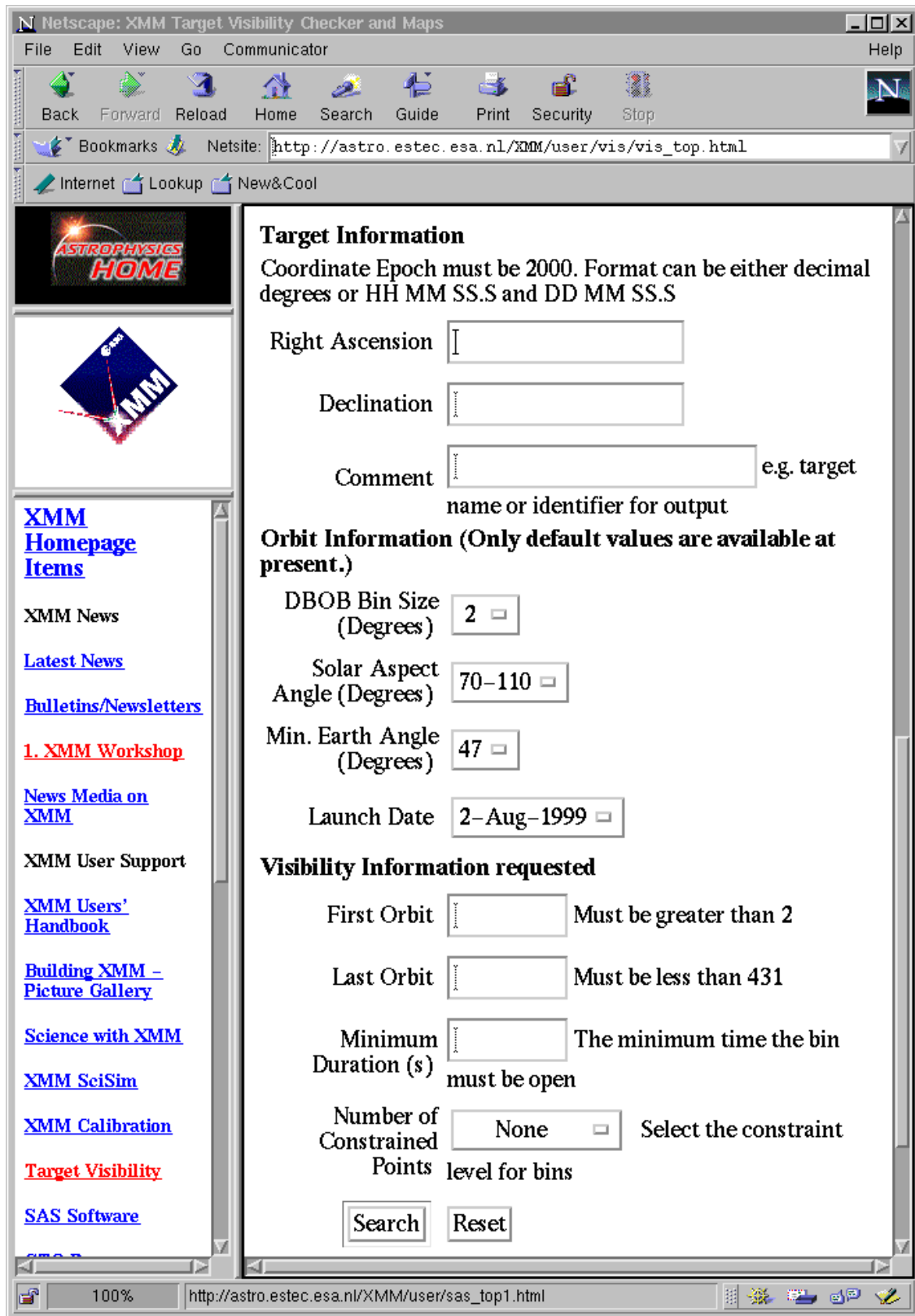


Fig. 5.— Screen shot of the XMM Target Visibility Tool interface.

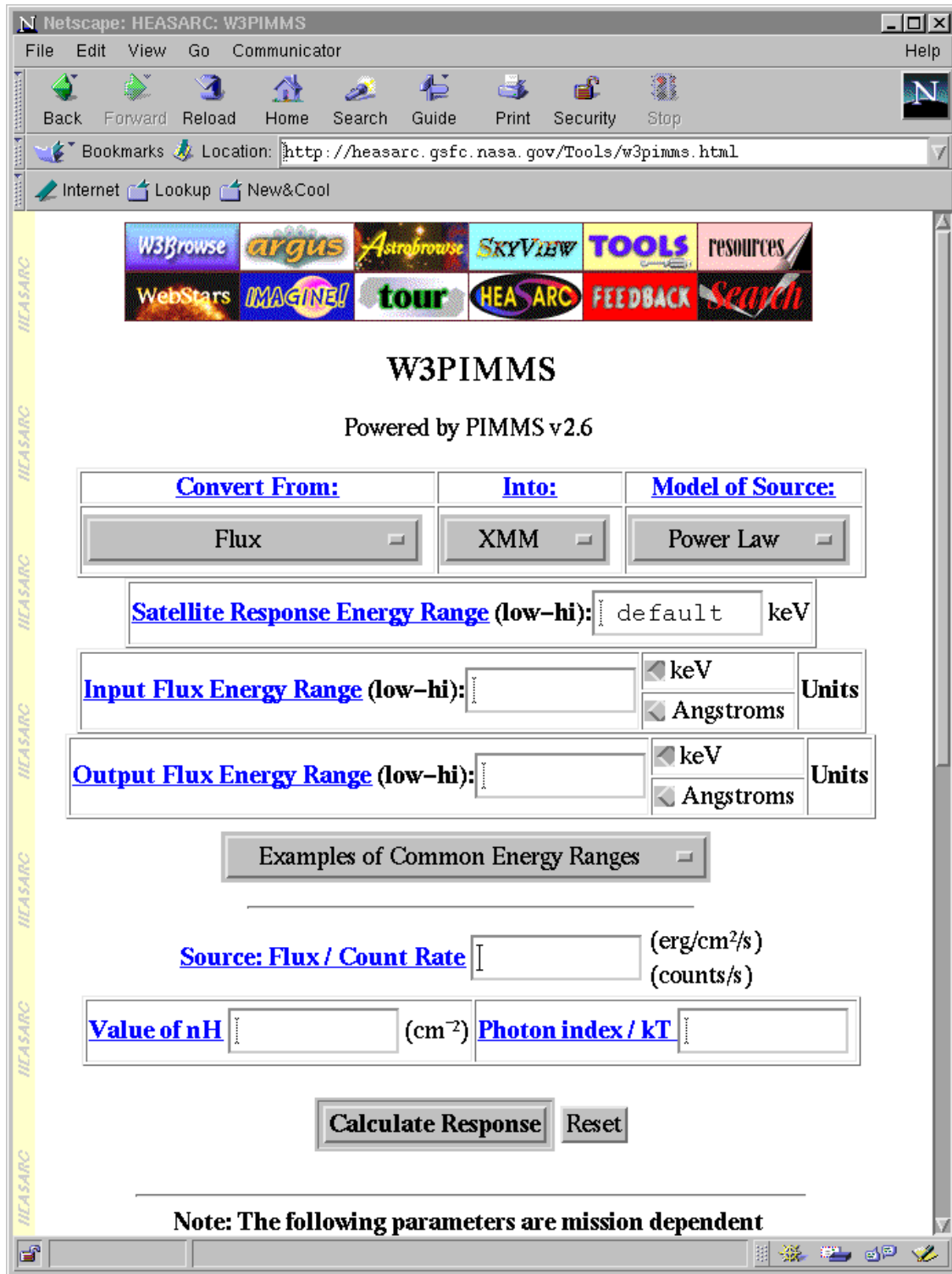


Fig. 6.— Screen shot of the W3PIMMS count rate conversion tool interface.