Remote Interface for Science Analisys

XMM-Newton Remote Interface to Science Analysis Software: First public version

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ABSTRACT

RISA software allows scientists to discover, download and reduce on-the-fly, XMM-Newton data without having to install any project specific software and it uses all XMM-Newton Science Analysis Software capabilities (parameter interface and image selection expressions). It has been coded taking into account the Virtual Observatory paradigm, taking advantage of VO protocols such as SIAP and SAMP.

The software design is based on the client/server paradigm (using axis and tomcat server to deploy the application) and it has been developed to be used in GRID environments, but it can be easily adapted to any other system architecture such as cluster or cloud computing. The system allows the user to search for any XMM-Newton data (pointing or slew observation) using SIAP protocols and name resolver services. The application has been designed as a mission independent analysis tool, being possible to implement tasks and workflows from different missions.

The RISA client is able to work with raw XMM-Newton data or it can be also used starting with pipeline processed files. The user can create tailored workflows fully configurable or can also select pre-defined workflows that automatically produce XMM-Newton images, spectra, light curves or source lists. The results can be sent through SAMP messages to viewer applications such as VoSpec or ds9. Finally, the user can retrieve the data when the jobs have finished.

RISA IN ACTION...

START NEW SESSION

Load an existing RISA workflow or Save your current workflow for future use.

Search for an observation.
Multiple choices available:
- Search by Name
- Search by coordinates
- Search by Revolution
- Search by Observation ID
- Search for XMM-Newton Slews

Also possible to upload a text file with your request in any of these formats

Vizier query to resolve names.
SIAP query to retrieve the XMM-Newton information.

SELECT OBSERVATIONS

Have a look to the details of your observation clicking on the ShowInfo button.

Select the observations you want to analyze by clicking the checkbox button

Then select the type of XMM-Newton data you want to analyze:
- **Raw Data: ODF**
- **Pipeline Products: PPS**

Select the workflow you want to create:
- **Users Defined Thread: Custom SAS workflow**
- **Thread: Predefined threads**

Finally click on the Workflow button

CREATE WORKFLOW I

Workflow builder window:
- **Initial SAS Tasks**
- **Tab for each XMM-Newton instrument**

Select your Tasks from the SAS Tasks window.
This window guides you enabling or disabling tasks depending on the instruments you are working with.

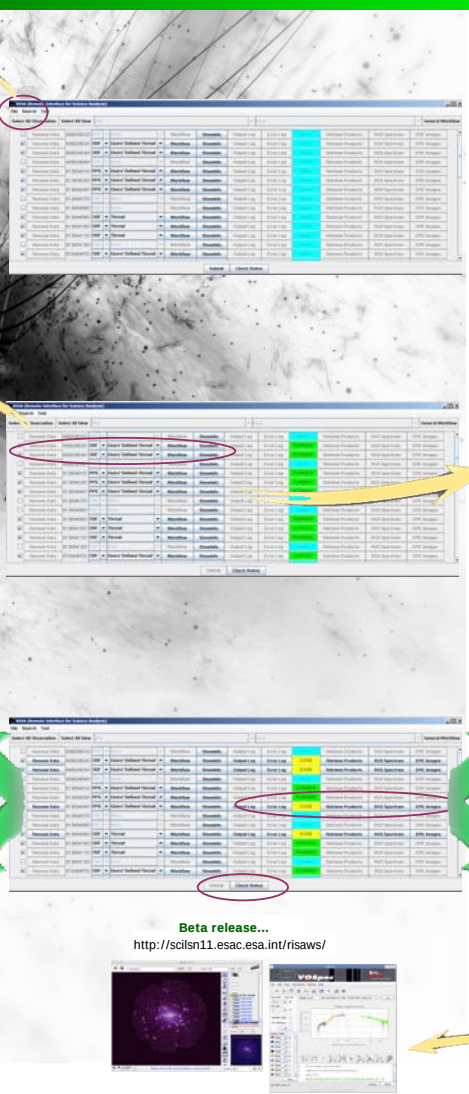
Select a task and a new fully configurable SAS parameter window will pop-up.

CREATE WORKFLOW II

RISA helps the user to build the workflow.
When you select a task, a new window with the possible input parameter values pops-up.

These parameters are transferred to the task.

When the workflow has finished click on the Close button.



Beta release...
http://scilsn11.esac.esa.int/risaws/

VO INTEROPERABILITY I

RISA makes use VO technologies such as SAMP

On the Main Menu, Tool button registers the application to the hub.
SAMP allows RISA to send and receive information from other applications such as VoSpec, ds9 or Aladin.

While creating the workflow, you can right-click on the exposure id of the EPIC image and the image is displayed in ds9.

You can select your source and background regions and send it to RISA via SAMP message.

CREATE WORKFLOW III

RISA allows the user to create pre-defined workflows.

A new workflow window will pop-up with two different threads:
- **psechain**
- **slew**

Using psechain you can automatically create light curves or spectra, following standard filtering.

GRID AND ARCHIVE

Sending jobs to the GRID and retrieving data from the archive

Finally, click on the Submit button you will be asked to introduce your XSA user name and password.
Information is sent to the RISA server.
GRID templates are created and sent to working nodes in available GRIDs.

Clicking on the Check Status button you can check the status of your jobs.

VO INTEROPERABILITY II

Working with the results using VO apps. and retrieving products

When the job has finished, you can have a look at the error and output logs.

You can retrieve your products by clicking.

Thanks to SAMP you can also directly see your spectra or images.

Right click on RGS Spectrum | EPIC Images and you will be able to send spectra or images to VoSpec or Aladin.

SUMMARY: RISA is a true VO compliant application able to perform full data reduction of XMM-Newton observations in a GRID architecture. Our goal, using this approach, is to move beyond the paradigm of simply delivering products to providing a complete solution for the non-expert astronomer, offering a complete suite of programs to reduce and analyze XMM-Newton data or any other data set, without having to install any dedicated software and providing all functionalities in a easier way.
More and more astronomers are gathering astronomical data to cross-match results with catalogues in different energy ranges. This implies handling data from possible unfamiliar fields of astronomy and their associated software.
This new web interface to old software has been created to help non-expert astronomers to reduce and access astronomical data using flexible and intuitive applications. Providing a common and standarized framework that allows the user to reduce data from different energy ranges in a transparent way.
In the near future we will study the possibility of running these applications in a Cloud environment using middleware such as OpenNebula (http://www.opennebula.org/).

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