

RISA

Remote Interface to SAS Analysis

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RISA NOW AND AS A LONG TERM SAS PRESERVATION INFRASTRUCTURE



- RISA is a client/server application able to process XMM-Newton SAS workflows
- We have developed a set of SAS “microservices” that gives XSA with on-the-fly processing capabilities, such as: spectra and light curve creation, image creation and event filtering
- With this scheme we tackle at the same time two points:
 - In the long term:
We preserve the SAS data analysis capabilities through web services, keeping SAS frozen in a VM
 - In the short term:
We provide users on-demand reprocessing capabilities using the latest SAS and calibration versions

we also provide the scientific community a way to process XMM-Newton data without having to install SAS on their computers.

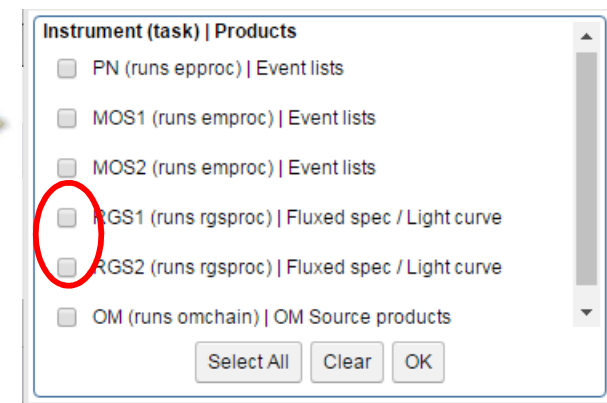
XSA/RISA FUNCTIONALITIES

Observation processing

Accessible from the XSA through OBSERVATION panel



	Obs.ID	EPIC	RGS	Target	RA	DEC	Rev	Distance	Start Date
	0109270101			M31Core	00h 42m 42.99s	+41d 15' 46.0"	285	0.44	2001-06-29 06:15:17



Instrument (task) | Products

- ☐ PN (runs approc) | Event lists
- ☐ MOS1 (runs emproc) | Event lists
- ☐ MOS2 (runs emproc) | Event lists
- ☒ RGS1 (runs rgsproc) | Fluxed spec / Light curve
- ☒ RGS2 (runs rgsproc) | Fluxed spec / Light curve
- ☐ OM (runs omchain) | OM Source products

Select All Clear OK

http://xxxx.xxx.xxx/RISA_reprocessing?

obsid=0135720601&

PN=yes&

MOS1=yes&

MOS2=yes&

RGS1=yes&

RGS2=yes&

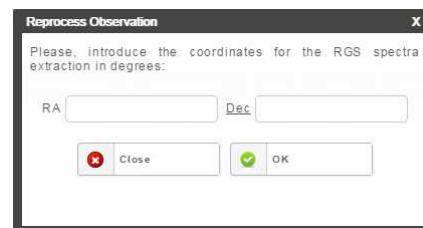
OM=yes&

ra=15.958335&

dec=-72.031294&

target=ODF&

mail=



Reprocess Observation

Please, introduce the coordinates for the RGS spectra extraction in degrees:

RA DEC

Close OK



Reprocess Observation

RGS spectra of observation 0109270101 is going to be extracted using the following coordinates:

RA(deg) = 10.679166
DEC(deg) = 41.26278

Click "Use my Coordinates" to change them or "Continue" to go on with the process.

Continue My Coordinates

Results

[err_20170426172936_0109270501_ODF](#)
[out_20170426172936_0109270501_ODF](#)
[risa_20170426172936_0109270501_ODF.tar.gz](#)








SAS Script

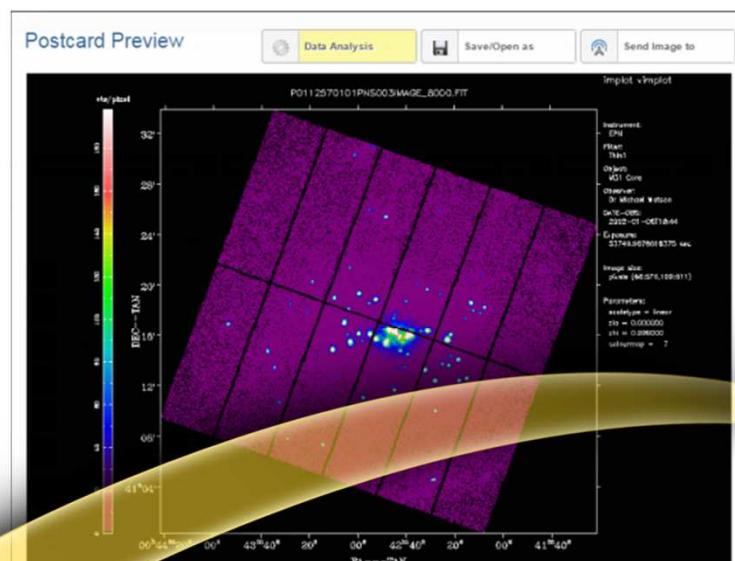
1. xmmextractor

XSA/RISA FUNCTIONALITIES

EPIC Data Analysis

Accessible from the XSA through EXPOSURES panel

OBSERVATIONS (1)		EXPOSURES (13)		EPIC PPS SOURCES (229)		OM PPS SOURCES (1)	
Columns	Column units	Save table as	Send table to				
Obs.ID	Exp.ID	Img	Inst	Mode			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0112570101	S001		EMOS1	Full Frame			
0112570101	S002						
0112570101	S003						
0112570101	S007						
0112570101	S008						
0112570101	S009						
0112570101	S010						



DATA ANALYSIS

Obs Id

0112570101

Instrument

EPN

Exposure

S003

Flag

Pattern

PI (eV)

Background flaring filtering

☐

Suggested ≤ 0.4 cts/s for 'PN' instrument

Product Type

Spectra

Spectra

Light Curve

Image

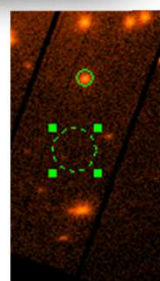
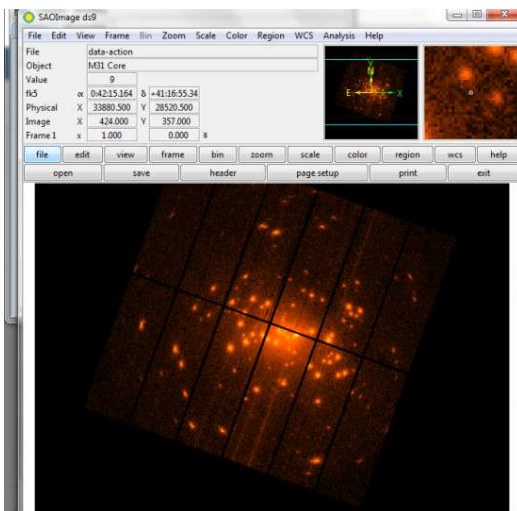
Events

Centre and optimize source region

☐

Send Image to DS9

Cancel



VO SAMP
(Simple Access Message Protocol)
NOTE: Manually disabled M-Type restrictions

Product Type

Spectra

Centre and optimize source region

☒

Send Image to DS9

Get DS9 Source

circle(30960.5,20219.759,407.71364)

Get DS9 Background

circle(30427.167,16693.833,1093.4716)

XSA/RISA FUNCTIONALITIES

EPIC Data Analysis

http://xxxx.xxx.xxx/RISA_sl?

product=spectra&
obsid=0651300301&
inst=EMOS2&
exp=S003&
target=WR140&
srcreg=((X,Y) IN
 circle(24385.14,24706.642,592.29775))&
bkgreg=((X,Y) IN
 circle(23969.759,34756.796,1519.4881))&
optsrcregion=no&
pimin=200&
pimax=8000&
pattern=<=12&
flag=0&
highbkgflaringcountrate=<=0.35 &
timebinsize=100&
mail=

SAS Script

Spectra

1. *evselect* → Filtering and image generation
2. *tabgtigen* → GTI generation (high bkg flaring filtering)
3. *eregionanalyse* → centroid and optimize source region
4. *especget* → spectra, ARF and RMF generations

Light curve

1. *evselect* → filtering and image generation
2. *tabgtigen* → GTI generation (high bkg flaring filtering)
3. *evselect* → source and background time series generation
4. *epiclccorr* → Time series correction





Image

1. *evselect* → filtering and image generation
2. *tabgtigen* → GTI generation (high bkg flaring filtering)

Event filtering

1. *evselect* → filtering
2. *tabgtigen* → GTI generation (high bkg flaring filtering)

Products (spectra)

 R0555470701PNS003BGSPEC0001.FIT
 R0555470701PNS003SRCARF0001.FIT
 R0555470701PNS003SRCRMF0001.FIT
 R0555470701PNS003SRSPEC0001.FIT

Results

[err_20170423185400_0555470801_WR140](#)
[out_20170423185400_0555470801_WR140](#)
[risa_20170423185400_0555470801_WR140.tar.gz](#)

XSA/RISA FUNCTIONALITIES

EPIC sources spectra

Accessible from the XSA through EPIC PPS SOURCES panel

http://xxxx.xxx.xxx/RISA_singleskyprod?

product=spectra&
obsid=0202230201&
inst=EPN&
ra=10.8504&
dec=41.22551&
optsrcregion=yes&
highbkgflaringcountrate=<=0.4 &
target=SRC1 &
mail=







	ObsID	Src N	RA	DEC	Pos.Err
<input type="checkbox"/>	0112570101	130	00h 43m 50.77s	+41d 21' 17.8"	0.6
<input type="checkbox"/>	0112570101	124	00h 42m 49.93s	+41d 11' 09.1"	0.6
<input type="checkbox"/>	0112570101	140	00h 41m 50.44s	+41d 12' 12.9"	0.7
<input type="checkbox"/>	0112570101	67	00h 42m 15.70s	+41d 17' 20.4"	0.2
<input checked="" type="checkbox"/>	0112570101	12	00h 43m 05.69s	+41d 17' 02.8"	0.1

SAS Script

1. *region* → create file with regions from source list
2. *ebkgreg* → create background region
3. *ecoordconv* → convert coord to physical
4. *eregionanalyse* → centroid and optimize source region
5. *evselect* → filtering and image generation
6. *tabgtigen* → GTI generation
7. *especget* → spectra, ARF and RMF generation

Product

 R0112570101PNS003BGSPEC0001.FIT
 R0112570101PNS003SRCARF0001.FIT
 R0112570101PNS003SRCRMF0001.FIT
 R0112570101PNS003SRSPEC0001.FIT

Results

[err_20170426173418_0112570101_SRC12](#)
[out_20170426173418_0112570101_SRC12](#)
[risa_20170426173418_0112570101_SRC12.tar.gz](#)

FUTURE WORK

- Get user's (your) feedback

From testing phase we have already collect the following ideas

- Add time series plotting capabilities to allow user's define time filtering
 - Allow RISA services to work with intermediate files (customized GTI filtering)
 - Upload user's SAS workflows (RISA compatible "scripts")
 - ...
- Replace ds9 → **js9** (SAMP dependency will disappear)