



SAS developments and future plans

Carlos GABRIEL & S3MT* & SAS WG** & RISA collaboration***

XMM-Newton Science Operations Centre - ESAC / ESA

* Aitor Ibarra, Eduardo Ojero, Richard Saxton

** Jean Ballet(Saclay), Chris Brindle(MSSL), Hermann Brunner(MPE), Maite Ceballos (IFCA), Michael Freyberg (MPE), Matthias Hoefft (AIP), Georg Lamer(AIP), Brendan Perry (GOF), Simon Rosen (LUX), Masaaki Sakano (LUX), Anja Schroeder (LUX), Natalie Webb (CESR), Vladimir Yershov (MSSL) & S3MT

*** Aitor Ibarra, Ignacio de la Calle, Jesús Salgado, Pedro Osuna, Daniel Tapiador



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SAS development achievements

SAS version 7.1 released on 10 July 2007 (sorry, 5 days delay wrt my UG '07 promise!)

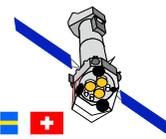
» **main improvements** in the area of **source detection** (2XMM Catalogue), together with

- * EPIC PN **temperature dependent gain correction** introduced
- * task ([espfilt](#)) for **soft proton screening and filtering**
- * PN **FIFO reset correction** implemented
- * master offset tables enabling **correction of PN spatial energy shifts**
- * [rgslccorr](#): **RGS light curve background subtraction and exposure correction**
- * treatment of **RGS single readout node data**
- * task ([rgsfluxmodel](#)) for **exporting RGS flux spectrum as a model**
- * **OM I/A photometry handling** introduced ([omphotom](#))
- * improvement of **OM grisms data processing**

task lccorr again removed from distribution due to several deficiencies

+ Slew Data Processing Software 2.1

+ Internal release of RISA (Remote Interface for Science Analysis)



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SAS 7.1.0 release experience

- release **far from being** "perfect":

Several problems:

1) two fundamental opposite time constraints

end of bulk reprocessing >>>> SAS 7.1 release | AO7

not leaving much time for release preparation

2) **firewall migration** at ESAC causing a lot of trouble in terms of integration, communication between machines, licenses obtainment

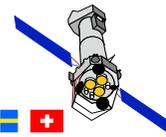
3) requested migration to new version of F95 (wrongly suspected reason for lccorr problems)

>> testing + validation were poor (especially in the use of final binaries)

>> consequences: several patches necessary

- missing packages and libraries
- MacOS library broken
- eexpmap bug

>> **SAS 7.1.1. (internal name) - August 2007**



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SAS 7.1.0 >> SAS 7.1.2

- RGS2 operated in single readout node from 17/8/2008 on

+ SAS 7.1 able to cope with
but not in case of "double events" occurrences (~ 10% of exposures affected)

>> SAS to be patched again: [rgsframes](#) new version

Using the opportunity of a new "patch window" > several minor fixes and upgrades:

[addattribute](#)-2.1: special extension name PRIMARY was being handled incorrectly. Now handles all blocks equally.

[arfgn](#)-1.73.3 and [backscale](#)-1.3.: handling correctly rotated ellipses.

[caloalutils](#)-1.104.2: removed unwanted debug line in src/Xmm.cc

[epevents](#)-6.42.2: parameter "withtempcorrection" set by default to "yes" (also in [epicproc](#) and [epchain](#))

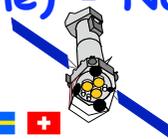
[epreject](#)-5.9.1: prevented PHA values from going negative if illegal values in master offset

[omgrism](#)-1.18.3: fixed a bug that could result in a crash of the task when processing crowded fields + better output

[rgsframes](#)-3.17.2: modified to be able to process single readout node data even in the presence of "duplicated events".

[rgsproc](#)-1.26.2: update the `entrystage` and `finalstage` parameter values.

>> SAS 7.1.2. (internal name) - Nov. 2007



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> SAS 7.1.2: simplifying installation

Due to the several patch files (7.1.0 > 7.1.2) becoming necessary **SAS installation** procedure changed and even **more simplified**:

Only **ONE** file **per operating system** containing everything + installation script (including check of completeness)

1) 1 click to download: from webpage (<http://xmm.esac.esa.int/sas> ...)

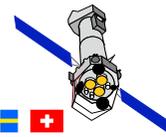
>> xmmsas-*platform*-ALL.tar.gz

2) 1 command to untar:

>> tar xvzf xmmsas-*platform*-ALL.tar.gz

3) 1 command to install:

>> /bin/sh install.sh



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Supported platforms

Supported platforms (SAS 7.1.x)

Linux

Red Hat

9.0: Built on 9. Tested to work on Fedora Core 1.

EL3: Built on RHEL 3. Ttw on FC1 and FC2.

EL4: Built on RHEL 4.

FC3: Built on Fedora Core 3.

SuSE

7.3: Built on 7.3. Ttw on Red Hat 7.3.

8.2: Built on 8.2. Ttw on SuSE 9 and 9.1.

Solaris

2.8: Built on 2.8.

2.9: Built on 2.9.

Mac OS X PowerPC

10.2: Built on 10.2 (Darwin 6.8 / Jaguar)

10.3: Built on 10.3 (Darwin 7.X/Panther)

10.4: Built on 10.4.2 (Darwin 8.2/Tiger)

Windows: VM4SAS = virtual machine running Fedora Core 4 on MS Windows

SAS 7.1.x runs on many other "not supported" platforms:
including + Mac OS Tiger on Intel
+ Mac OS Leopard on PPC & Intel
(spec. instructions on the web)

The screenshot shows two browser windows. The top window, titled 'Netscape: XMM SAS: integration results', displays a table of integration results for various SAS versions and platforms. The bottom window, titled 'Netscape: SAS integration', shows the details of the integration process, including the user 'pashuid', machine 'xmmal13', and a list of packages with their build status.

version	platform	size (MB)	architecture	language	language details	language libraries	language strings	language charset	language encoding	language locale	language user	language details
xmmasa_20031001_0511	Red Hat Linux (i386)	1	i386	EL3	EL3	EL3	EL3	EL3	EL3	EL3	EL3	EL3
xmmasa_20031001_0511	Red Hat Linux (i386)	1	i386	EL3	EL3	EL3	EL3	EL3	EL3	EL3	EL3	EL3
xmmasa_20031001_0511	Red Hat Linux (i386)	1	i386	EL3	EL3	EL3	EL3	EL3	EL3	EL3	EL3	EL3
xmmasa_20031001_0511	Red Hat Linux (i386)	1	i386	EL3	EL3	EL3	EL3	EL3	EL3	EL3	EL3	EL3

SAS integration details:
 Reported by: pashuid
 Machine: xmmal13
 Machine details: Linux: xmmal13 2.4.16-64GB-SMP #1 SMP Mon Apr 15 09:16:20 GMT 2002; #86 ukuwano
 Created on: Sun Oct 5 21:37:36 2003
 Release: xmmasa_20031001_1631

Re-test:
 # Second test: low memory
 # SAS_MEMORY_MODEL=low
 export SAS_MEMORY_MODEL

Failed:
 9 out of 184.
 # Error: daskh edactet_chain implet locorr odhngset ppszzumma rreproe plocow

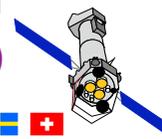
Color scheme:
 formal
 compilation_tests
 documentation
 compilation
 tests
 ok

Details:
 Packages are listed by build order.

Package	size	time	depchk	distchk	make	depend	make	has	make	doc	make	tests	has	tests	make	test	test
gao	1.408	17.34	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
gms	1.107	17.32	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
testoff	0.43	17.34	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
gms	1.71	17.34	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
gmsmaker	1.27	17.34	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
gmsmakerdata	0.7	17.34	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
devel	1.49	17.34	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
releasecheck	0.3	17.34	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
error	1.44	17.34	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok



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New building H/W

Migration to new H/W

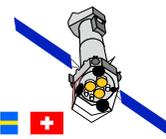
(took longer than expected - many of them still not building SAS)

- >> **Dell Rack with 2 blade servers, 1 CX300 expansion cabinet**
- >> **RHEL5 + RHEL4**

+ 8 further blade processors (2 x quad-core Xeon E5335 2.0GHz - 8GB RAM)

blade	os	comment
3	fc 8-32	Fedora Core latest
4	SuSE 7.3-32	compatibility builder
5	SuSE 10.X-32	SuSE latest
6	fc 8-64	64 bits
7	SuSE 10-64	64 bits
8	Multiplatform	Several Linux flavors using virtualization
9	ubuntu 7.X-32	Ubuntu
10	SL 4.x-32	Scientific Linux

In addition, new iMac >> MacIntel Leopard



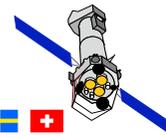
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Next release: SAS 8.0

Main reasons for release:

- new light curve background subtraction and exposure correction
`epiclcorr` - replacing `lccorr`
- slew data analysis fully integrated in SAS
`eslewchain`
- RGS alternative analysis based on a wavelength grid (non default)
many `rgsxxx` data reduction tasks, adapted for working on wavelength grid
- a centrally maintained script for quasi-optimal extraction of point sources
`epschain`
- a new task for rate dependent CTI + gain correction on PN fast modes
`epfast`
- a new task to "glue" data from consecutive pointings, as for SSO (perhaps only SOC now)
`xmmglue`
- 2-d elliptical PSF inclusion >> integration into encircled energy corrections (non default)
`eregionanalyse`, `arfgen` and `xmmselect` upgrades
- improved OM source detection (going into catalogue)
`omdetect`, `omsrclistcomb`, `omatt` and `ommosaic` upgrades



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SAS 8.0 release plans

We are almost in the schedule for SAS 8 release:

- + SAS development in "release track" mode from 9/5/08
- + validation analysis going on until 13 June

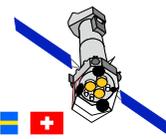
If everything OK:

- official release on **18 June +/- 48 hours** (to avoid getting blamed next time)

SAS validation exercise fully planned, including thorough checking of new elements:

- + "external" participation: LUX, AIP, MSSL
- + first tests already started

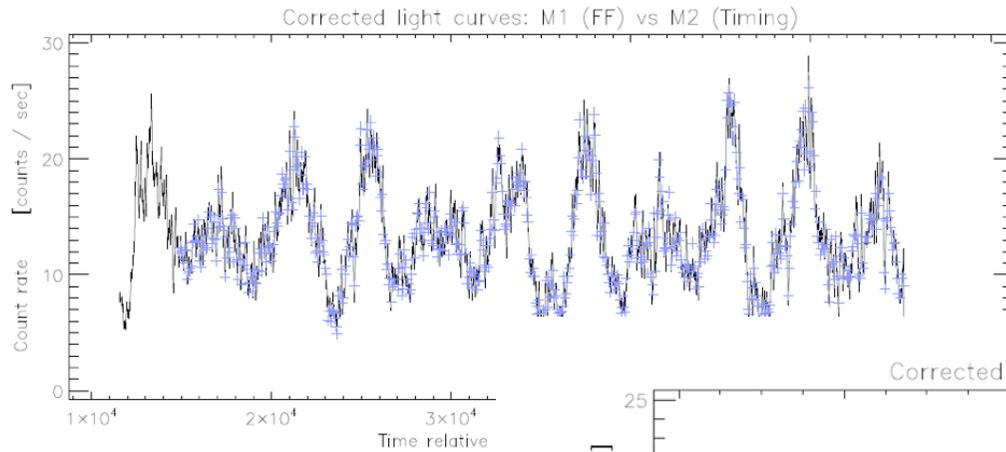
>> promising results seen so far with epiclccorr and rgs1ccorr, pending a quantitative evaluation



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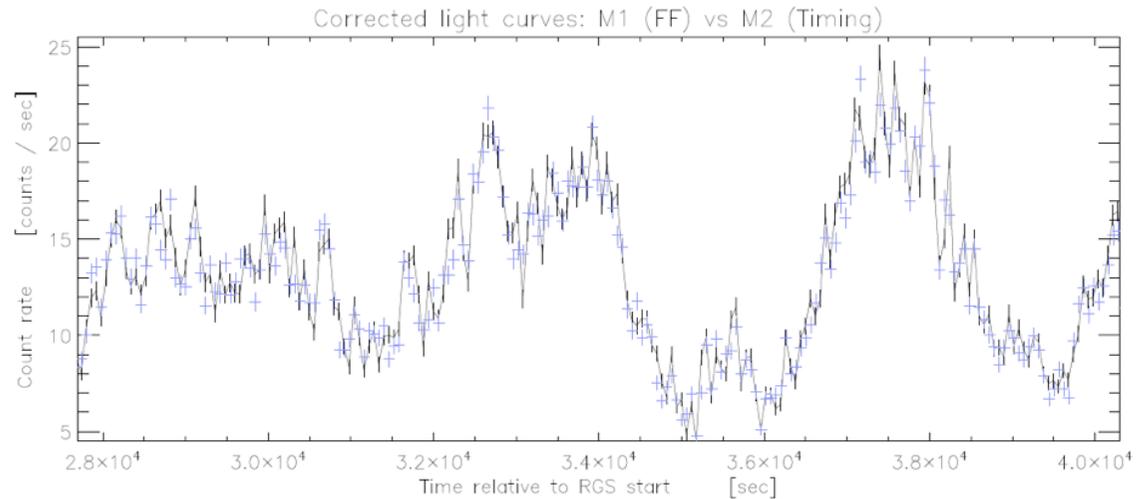


first epiclccorr validation tests



Legend:

Axis:	Curve:	Description:	Annotation:
1	—	MOS1 - Full Frame	
1	+	MOS2 - Timing	

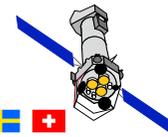


Legend:

Axis:	Curve:	Description:	Annotation:
1	—	MOS1 - Full Frame	
1	+	MOS2 - Timing	



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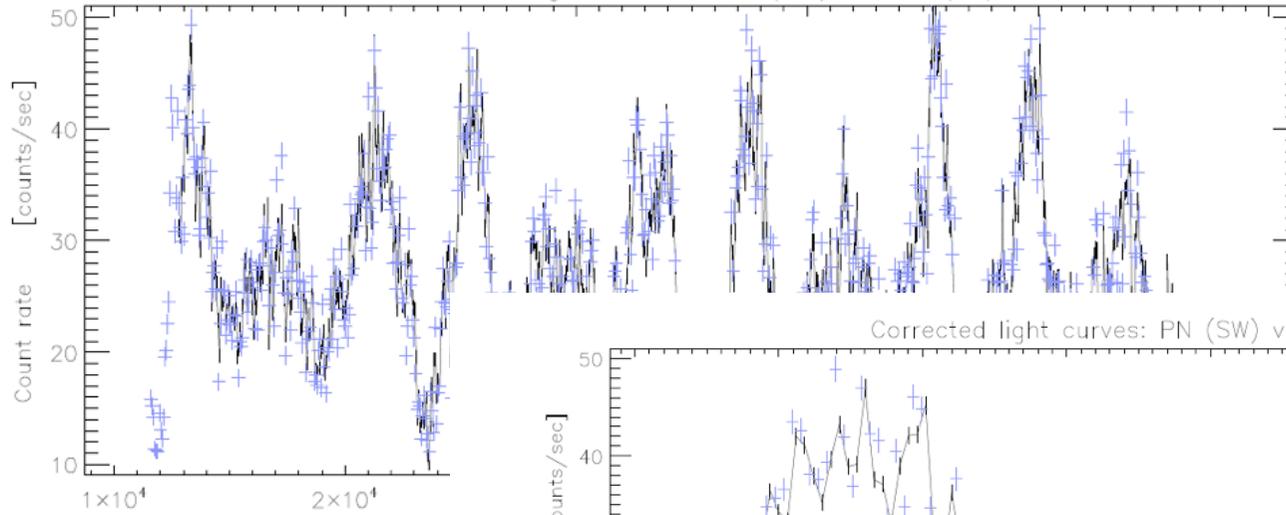


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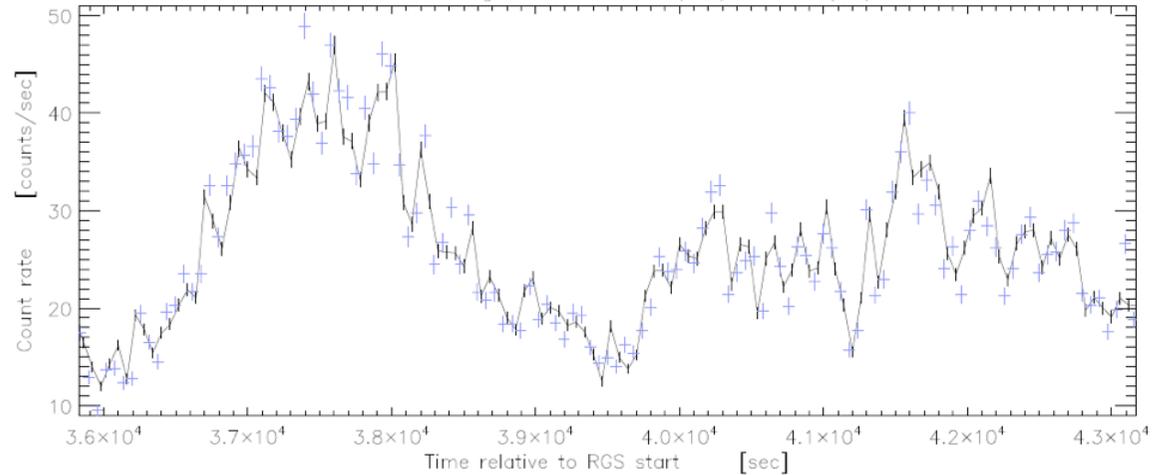
first epiccorr validation tests

Corrected light curves: PN (SW) vs M1 (FF)



Legend:
 Axis: Curve: Description: Annotation:
 1 ——— PN lc - bkg subtr
 1 + M1 lc - bg subtr * 2.0

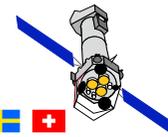
Corrected light curves: PN (SW) vs M1 (FF)



Legend:
 Axis: Curve: Description: Annotation:
 1 ——— PN lc - bkg subtr
 1 + M1 lc - bg subtr * 2.0



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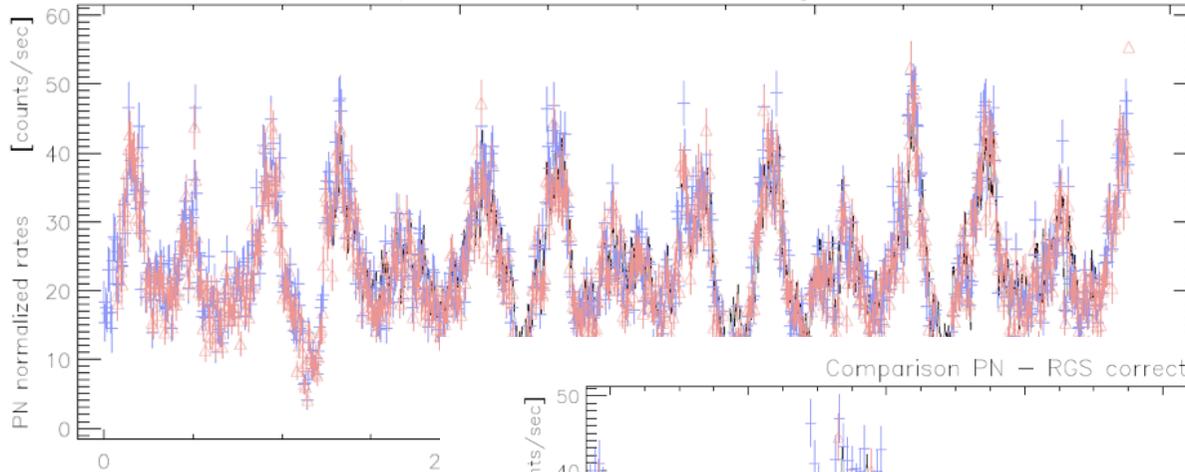


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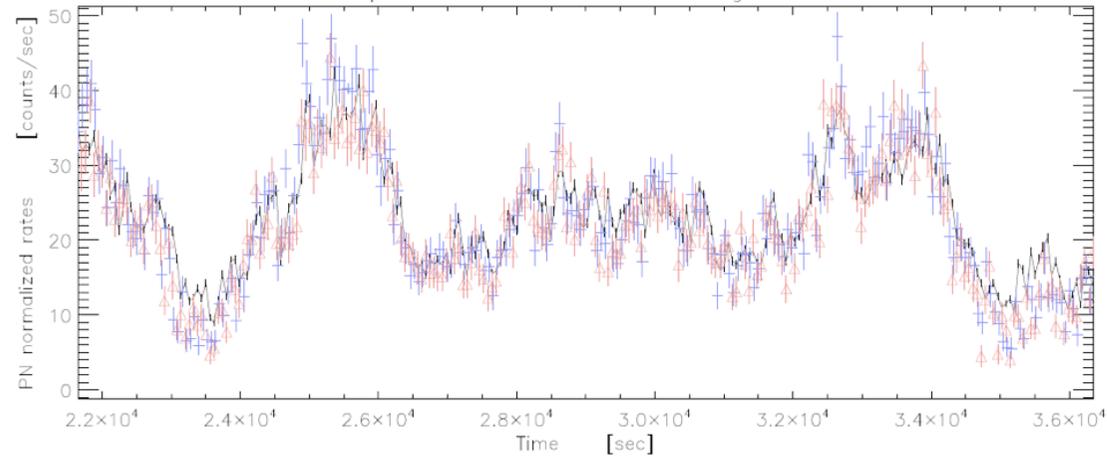


first epiclccorr/rgslccorr val. tests

Comparison PN – RGS corrected light curves



Comparison PN – RGS corrected light curves



Legend:

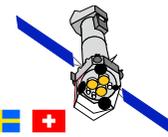
Axis:	Curve:	Description:	Annotation:
1	—	PN count rates	
1	+	RGS1 count rates * 12.5	
1	△	RGS2 count rates * 12.5	

Legend:

Axis:	Curve:	Description:	Annotation:
1	—	PN count rates	
1	+	RGS1 count rates * 12.5	
1	△	RGS2 count rates * 12.5	



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SAS development / maintenance evolution

- we cannot avoid **manpower reduction** in the future:

* SAS "external" developers migration to other projects, partly based on personal interest, partly based on cuts by funding national agencies

* SAS "central team" will be also reduced in some (hopefully far) future

My top 4 for planning / working for high efficiency in SAS maintenance:

» RISA as the long term future for supporting data reduction

» increased use of virtual machines for reducing number of platforms (mid-term)

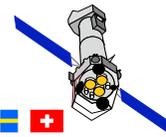
» increase SAS CCB role in SAS maintenance (revision of "major" SPRs + 1 SPR system)

» increase SAS WG cohesion (regular meetings + "shadow maintenance"/rotation)

SAS is partly responsible for the smashing XMM-Newton scientific success and should continue to be it !!



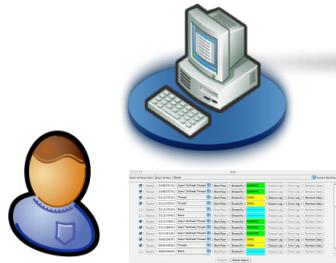
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RISA Architectural Design



RISA CLIENT APPLICATION

RISA Request (VO Table). SOAP Message

RISA Submitted Job Info. Results Info



RISA WEB SERVICE

The Server application (running on Apache Tomcat) creates Grid template files that are sent to each of the available Grid resources.



GRID TEMPLATE

The Server creates the template using the GridWay* DRMAA and submits the jobs (with a unique identifier each) to the GRID for execution.

Grid Layers

- GridWay
- Meta-Scheduler
- GT4
- Grid Middleware
- SGE 6.0u6
- Local Resource Management System



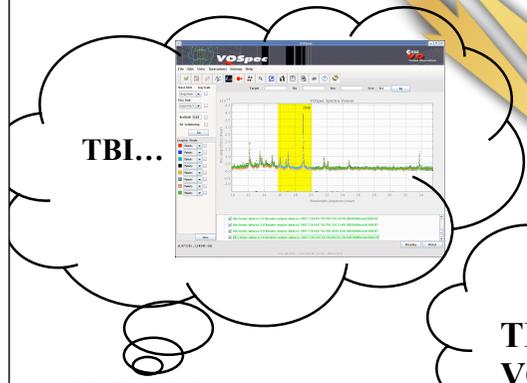
GRID

The workflows are executed in the available Grid nodes. The products are stored in a Data Product Storage unit.



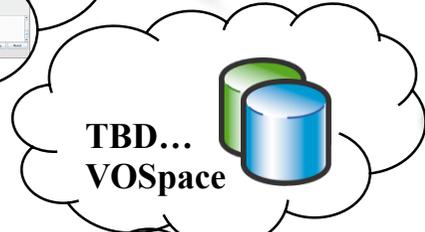
XSA

Each node in the GRID makes a request to the XMM-Newton Science Archive (XSA) to retrieve the requested data.



VO TOOLS

RISA Client should allow the interaction with VO applications to be as close as possible with the new emerging astronomical applications.



DATA PRODUCT STORAGE

RISA Service gets notified when the jobs have finished. The application is designed to send the output data to persistent layers, compliant with the emerging VOspace (planned to be used in the future) protocol.



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RISA - Client side

Search Ra-Dec

RA: 05 28 45.19 Dec: -65 26 51.1

Search Observation ID

Search Observation ID:

Search Revolution Number

Search Revolution Number:

Search Name

Search Name: Mkn421

Set Delete

Mkn421

Load File Submit Close Exit

0202230301

Name: RX J0042.6+4115

RISA

Select All Observation Select All Slew None

Repeat	Obs ID	Thread	Workflow	ShowInfo	Status	Output Log	Error Log	Retrieve Data
<input checked="" type="checkbox"/>	0109270101	Users' Defined Thread	Workflow	ShowInfo	RUNNING	Output Log	Error Log	Retrieve Data
<input checked="" type="checkbox"/>	0109270701	Users' Defined Thread	Workflow	ShowInfo	RUNNING	Output Log	Error Log	Retrieve Data
<input checked="" type="checkbox"/>	0112570101	Thread	Workflow	ShowInfo	DONE	Output Log	Error Log	Retrieve Data
<input checked="" type="checkbox"/>	0112570201	Thread	Workflow	ShowInfo	DONE	Output Log	Error Log	Retrieve Data
<input type="checkbox"/>	0112570301	None	Workflow	ShowInfo	-----	Output Log	Error Log	Retrieve Data
<input type="checkbox"/>	0112570401	None	Workflow	ShowInfo	-----	Output Log	Error Log	Retrieve Data
<input checked="" type="checkbox"/>	0112570601	Users' Defined Thread	Workflow	ShowInfo	RUNNING	Output Log	Error Log	Retrieve Data
<input checked="" type="checkbox"/>	0151580401	Users' Defined Thread	Workflow	ShowInfo	RUNNING	Output Log	Error Log	Retrieve Data
<input checked="" type="checkbox"/>	0151581301	Users' Defined Thread	Workflow	ShowInfo	RUNNING	Output Log	Error Log	Retrieve Data
<input checked="" type="checkbox"/>	0202230201	Users' Defined Thread	Workflow	ShowInfo	DONE	Output Log	Error Log	Retrieve Data
<input checked="" type="checkbox"/>	0202230301	Thread	Workflow	ShowInfo	DONE	Output Log	Error Log	Retrieve Data
<input type="checkbox"/>	0202230401	None	Workflow	ShowInfo	-----	Output Log	Error Log	Retrieve Data

Submit Check Status

Workflow builder: Obs ID=0056030101

Thread

Task: rgs_thread

Set Delete

- Thread
 - epic_lightcurve_thread
 - epic_edetectchain_thread
 - rgs_thread

Apply Close Exit

XSA connection

XSA User ID: cgabriel

XSA Password: *****

E-Mail: carlos.gabriel@esa.int

Cancel Set

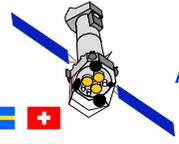
SAS Task:

- PNWorkflow
 - Observation
 - S003
 - tabgtigen
 - evselect
 - table=0380_0109270701_EPN_S003_ImagingEvts.ds
 - withrateset=no
 - cleandss=no
 - zerrorcolumn=EWEIGHT
 - ximagemin=1
 - makeratecolumn=no
 - specchannelmax=4095
 - detect...

Apply Close Exit



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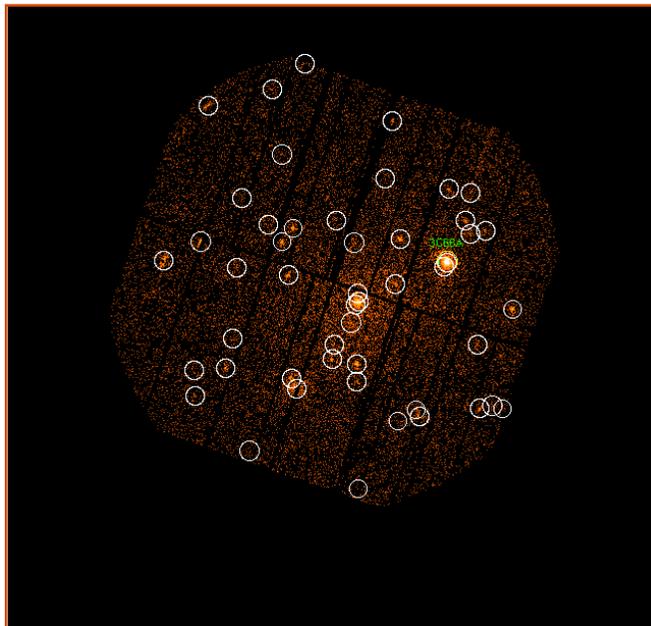


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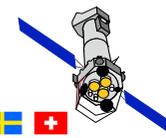
The pre-defined Workflows

- * epic_event_thread >> epproc up to calibrated event list
- * epic_edetect_thread >> basic data reduction + full source detection



```
#> Count Rate Information:
Source IDs (from emllist.fits table):
PN : 1
MOS1: 1
MOS2: 1
Source and BKG Count Rates in entire energy range considered:
PN :
PN SRC Rate (cts/s): 1.1392381E+00 +/- 1.0637643E-02
PN BKG Rate (cts/s): 0.0195506674078916 +/- 0.036699068143454
MOS1:
MOS1 SRC Rate (cts/s): 3.2014287E-01 +/- 5.0262189E-03
MOS1 BKG Rate (cts/s): 0.00530890110583295 +/- 0.0167856918175519
MOS2:
MOS2 SRC Rate (cts/s): 3.3450556E-01 +/- 5.8960547E-03
MOS2 BKG Rate (cts/s): 0.00561440072680486 +/- 0.0200144949065402
Source Count Rates in different energy ranges considered:
PN :
SRC Rate (cts/s): 2.4940266E-01 +/- 4.9289092E-03 (300 - 500)
SRC Rate (cts/s): 7.3988515E-01 +/- 8.4731579E-03 (500 - 2000)
SRC Rate (cts/s): 1.0651147E-01 +/- 3.3092685E-03 (2000 - 4500)
SRC Rate (cts/s): 3.0946814E-02 +/- 1.9073915E-03 (4500 - 7500)
SRC Rate (cts/s): 1.2492072E-02 +/- 1.5752804E-03 (7500 - 12000)
MOS1:
SRC Rate (cts/s): 5.8711868E-02 +/- 2.1362361E-03 (200 - 500)
SRC Rate (cts/s): 2.0900330E-01 +/- 4.0289834E-03 (500 - 2000)
SRC Rate (cts/s): 4.1137852E-02 +/- 1.8261950E-03 (2000 - 4500)
SRC Rate (cts/s): 9.8072235E-03 +/- 9.4686495E-04 (4500 - 7500)
SRC Rate (cts/s): 1.4826214E-03 +/- 4.8489607E-04 (7500 - 12000)
MOS2:
SRC Rate (cts/s): 6.4728148E-02 +/- 2.5530811E-03 (200 - 500)
SRC Rate (cts/s): 2.1761690E-01 +/- 4.7265440E-03 (500 - 2000)
SRC Rate (cts/s): 4.1980453E-02 +/- 2.1152385E-03 (2000 - 4500)
SRC Rate (cts/s): 8.7778242E-03 +/- 1.0441919E-03 (4500 - 7500)
SRC Rate (cts/s): 1.4022345E-03 +/- 5.8347906E-04 (7500 - 12000)

#> Cross Correlation Information:
SOURCE PN MOS1 MOS2
RA DEC RA DEC RA DEC RA DEC
35.6650 43.0356 35.6645 43.0353 35.6646 43.0351 35.6647 43.0351
Distance to closest source in each instrument:
(If RA,DEC of the source is within ~0.5arcmin of RA,DEC of detected
camera source, it is assumed the source is the same)
SOURCE-PN : 0.000472826873991965 deg. Same source ? : YES
SOURCE-M1 : 0.000579208114900439 deg. Same source ? : YES
SOURCE-M2 : 0.00054597037255583 deg. Same source ? : YES
Comparing Source detection on different cameras:
(If RA,DEC of one camera is within 6arcsec of RA,DEC of another camera
it is assumed the source in both cameras is the same)
Distance PN-MOS1 : 0.000212938145100816 deg. Same source ? : YES
Distance PN-MOS2 : 0.000247730931787864 deg. Same source ? : YES
Distance MOS1-MOS2 : 7.30935773775494e-05 deg. Same source ? : YES
```





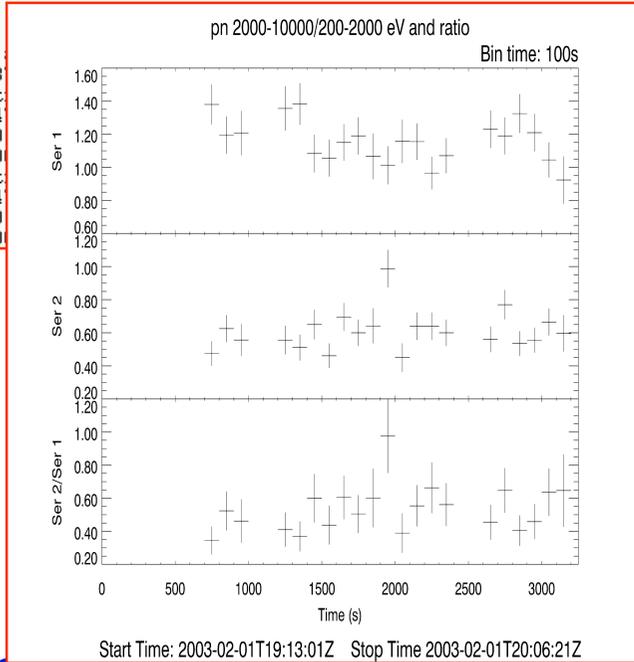
The pre-defined Workflows

* epic_lightcurve_thread >> basic data reduction (epproc) +
coordinates driven light curve extraction

```

#> Centroid of source to analyze (Physical Units)
PN
XC      : 34554
YC      : 30280.6
SRC RADII: 220 (11 arcsec)
BKG RADII: 440 - 538.887743412299 (22 - 26.944387170615 arcsec)
MOS1
XC      : 34559.7
YC      : 30274.3
SRC RADII: 240 (12 arcsec)
BKG RADII: 480 - 587.877538267963 (24 - 29.3938769133981 arcsec)
MOS2
XC      : 34558.8
YC      : 30275.4
SRC RADII: 240 (12 arcsec)
BKG RADII: 480 - 58
#> Information from Spect
pn Live Time : 1.5004
pn Backscale : 149600
pn Areascale : 1.0000
#> Information from Spect
pn Live Time : 1.5004
pn Backscale : 298700
pn Areascale : 1.0000

```



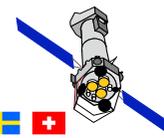
```

-----
pn : FILES:
pn : E 200-10000 eV: 3C66A_prbkg_e0.lc 3C66A_pnsource_e0.lc 3C66A_pnsourcebkgsubtracted_e0.lc
pn : E1 200-2000 eV : 3C66A_prbkg_e1.lc 3C66A_pnsource_e1.lc 3C66A_pnsourcebkgsubtracted_e1.lc
pn : E2 2000-4000 eV : 3C66A_prbkg_e2.lc 3C66A_pnsource_e2.lc 3C66A_pnsourcebkgsubtracted_e2.lc
pn : E3 4000-10000 eV: 3C66A_prbkg_e3.lc 3C66A_pnsource_e3.lc 3C66A_pnsourcebkgsubtracted_e3.lc
pn : -----
pn : NOTE: The total count rate is corrected for BACKSCALE and it is obtained as:
pn :         tot_rate=(rate*bin)/exposure, where rate is the rate in a given time
pn :         bin, multiplied by the bin size (in secs) and divided by the livetime (exposure).
pn :         The total counts is just counts=(rate*bin)
pn :         Two things have to be taken into account:
pn :         1) The bin time is not corrected for time gaps, is always fix to a given value.
pn :         2) Because there is no correction for time gaps, the light curve could have drops
pn :            in the count rate which are artificial. Hence the average rate is probably not
pn :            correct and will not agree with the total count rate for total energy range
pn : -----
pn : ENERGY RANGE 200 - 10000 eV:
pn : SRC-BKG REGION INFORMATION:
pn : The total counts for total energy range : 8529.0104+/- 94.730934 cts
pn : The total count rate for total energy range: 0.56842064+/- 0.0063133957 cts/sec
pn : The average rate for total energy range : 0.426451 cts/sec
pn : Range: 0.704148 - -0.00209073 cts/sec
pn : Starting Time : 1.2931626e+08 secs
pn : Exposure Time (Live Time): 15004.751 secs
pn : SRC REGION INFORMATION:
pn : The total count rate for total energy range: 8822.0000+/- 93.925502 cts
pn : The average rate for total energy range: 0.44110000 cts/sec
pn : Range: 0.72000000 - 0.00000000 cts/sec
pn : Starting Time: 1.2931626e+08 secs
pn : BKG REGION INFORMATION:
pn : The total count rate for total energy range: 291.48712+/- 12.082530 cts
pn : The average rate for total energy range: 0.014647594 cts/sec
pn : Range: 0.040066957 - 0.00000000 cts/sec
pn : Starting Time: 1.2931630e+08 secs
pn : -----
pn : ENERGY RANGE 200 - 2000 eV:
pn : SRC-BKG REGION INFORMATION:
pn : The total counts for total energy range : 7614.1387+/- 89.810034 cts
pn : The total count rate for total energy range: 0.50744851+/- 0.0059854396 cts/sec
pn : The average rate for 1st energy range : 0.380707 cts/sec
pn : Range: 0.666202 - 0.000000 cts/sec
pn : Starting Time : 1.2931626e+08 secs
pn : Exposure Time (Live Time): 15004.751 secs
pn : SRC REGION INFORMATION:
pn : The total count rate for total energy range: 7867.0000+/- 88.696110 cts
pn : The average rate for total energy range: 0.39335000 cts/sec
pn : Range: 0.68000000 - 0.00000000 cts/sec
pn : Starting Time: 1.2931626e+08 secs
pn : BKG REGION INFORMATION:
pn : The total count rate for total energy range: 251.92100+/- 11.232602 cts
pn : The average rate for total energy range: 0.012659346 cts/sec
pn : Range: 0.035058588 - 0.00000000 cts/sec

```



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Astronomy Science Operations Division
Science Operations Department



The pre-defined Workflows

* epic_spectrum_thread >> basic data reduction (epproc) +
coordinates driven spectrum extraction

```

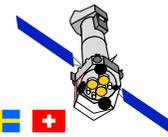
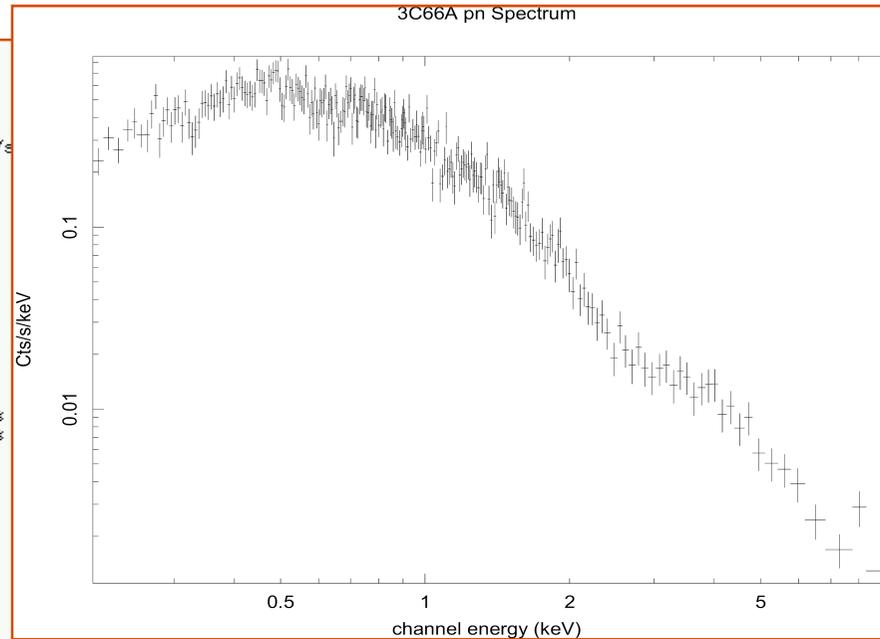
#> Galactic NH in units of E22 cm-2
RA : 35.6650
DEC: 43.0356
NH : 8.99E+20

#> Count Rates in different energy bands pn (file: /s
Background Subtracted Source Count Rate (cts/sec)
pn : 02-10keV: 0.5635 +-6.21795-03 97.6%
pn : 02-2keV : 0.5001 +-5.85657-03 97.6%
pn : 2-4keV : 4.0521-02+-1.66587-03 97.8%
pn : 4-10keV : 1.9461-02+-1.16658-03 96.1%
Background NOT Subtracted Source Count Rate (cts/sec)
pn : 02-10keV: 0.5774 +-6.20305-03
pn : 02-2keV : 0.5122 +-5.84281-03
pn : 2-4keV : 4.1454-02+-1.66214-03
pn : 4-10keV : 2.0260-02+-1.16201-03

#> Count Rates in different energy bands mos1 (file:
Background Subtracted Source Count Rate (cts/sec)
mos1 : 02-10keV: 0.1674 +-3.13257-03 97.5%
mos1 : 02-2keV : 0.1415 +-2.87904-03 97.6%
mos1 : 2-4keV : 1.7457-02+-1.01058-03 97.7%
mos1 : 4-10keV : 5.5877-03+-5.76795-04 96.3%
Background NOT Subtracted Source Count Rate (cts/sec)
mos1 : 02-10keV: 0.1716 +-3.12484-03
mos1 : 02-2keV : 0.1450 +-2.87218-03
mos1 : 2-4keV : 1.7867-02+-1.00827-03
mos1 : 4-10keV : 5.8038-03+-5.74662-04

#> Count Rates in different energy bands mos2 (file:
Background Subtracted Source Count Rate (cts/sec)
mos2 : 02-10keV: 0.1623 +-3.39780-03 97.8%
mos2 : 02-2keV : 0.1397 +-3.14939-03 98.0%
mos2 : 2-4keV : 1.3988-02+-1.00159-03 97.1%
mos2 : 4-10keV : 5.2491-03+-6.27223-04 93.6%
Background NOT Subtracted Source Count Rate (cts/sec)
mos2 : 02-10keV: 0.1664 +-3.39459-03
mos2 : 02-2keV : 0.1427 +-3.14300-03
mos2 : 2-4keV : 1.4404-02+-9.98716-04
mos2 : 4-10keV : 5.6091-03+-6.23236-04

```



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Astronomy Science Operations Division
Science Operations Department



The pre-defined Workflows

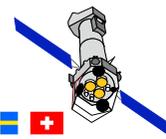
+:

- * `epic_analysis_thread` >> combination of "image" + "lightcurve" + "spectra" threads
- * `epic_slew_thread` >> full slew analysis (a la RDS)
- * `rgs_thread` >> full rgsproc processing

soon to appear:

- epic full analysis thread (different maximization of S/N)
- om threads ...

... open to suggestions



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Roadmap

- **α-version ready and working**

» several **pre-defined** workflows

» access to **all** individual SAS tasks, including access to **all** parameters

» access to **XSA**, including authentication for data download

» **ESAC grids** + external grid (IFCA) working together

» **large storage** area available for products

Internal version
v0.8 released

- **In the plan:**

* further standardization of SAS workflows

* upgrading of parameters interface (SAS I/F like)

* SAS error handling

* files uploading / intermediate starting points (event files, images, etc)

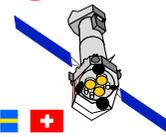
Public v1.0-1.5
~ 09/08 - 12/08

* VOspace for data products storage

* intermediate + info exchange data concept » full I/A capability
(use of VO Tools: VOSpec, Aladin, etc)

* merging system with an advanced workflow generator (eg. Taverna)

Public v2.0
~ 06-12/09



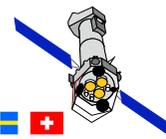
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Conclusions

We are:

- definitively helping observers to maximize the scientific return from the XMM-Newton mission with a mature, solid, everywhere running analysis system
- intending to maintain the high standards throughout the next ~ 15 years through a novel implementation of web services with full scientific analysis capabilities running in the GRID



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