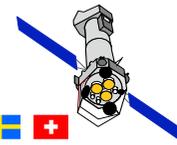




PN treatment in ESAS - SAS validation - Calibration files and Configuration Control

Carlos GABRIEL

XMM-Newton Science Operations Centre - ESAC / ESA



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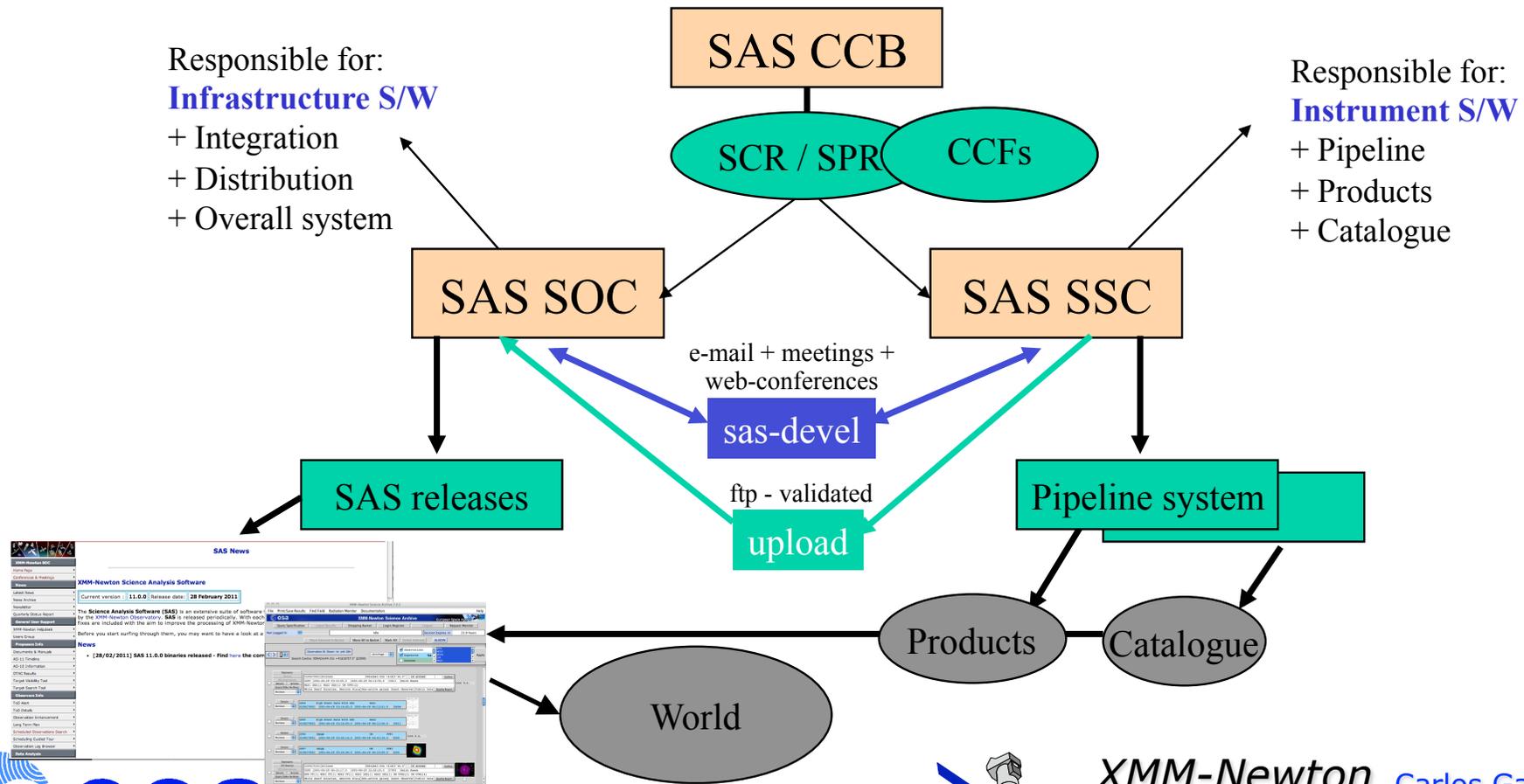


SAS development overall structure

SAS development team:

Central team (@ ESA's SOC) = scientists + S/W engineers >> all infrastructure tasks, incl. data and cal access layers

+ Distributed team (coordinated by SSC @ LUX) = scientists + instrument specialists >> instruments' data processing tasks



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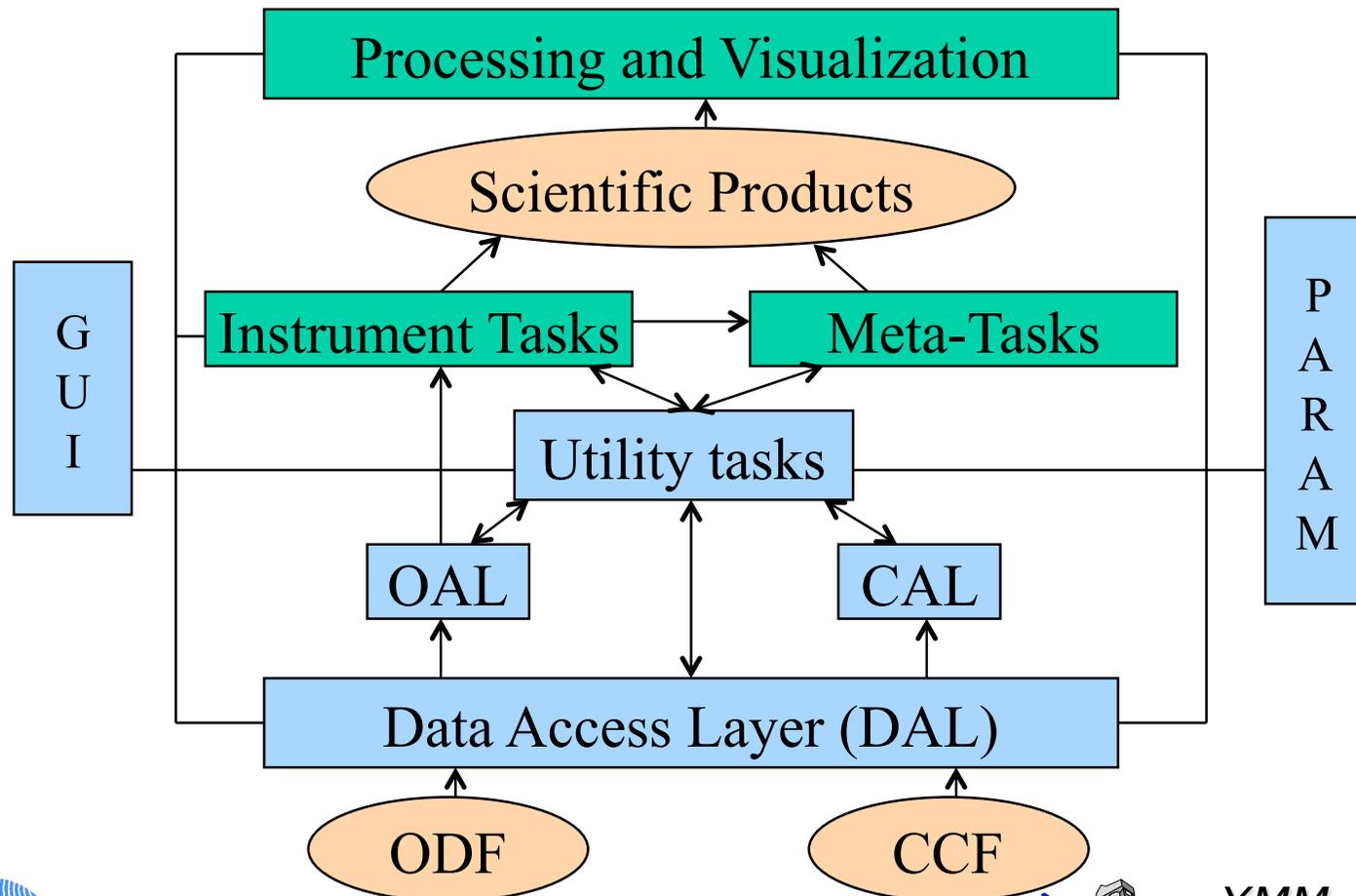


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A fully distributed development

SAS Subsystem Scheme



Work split:

 SOC

Small team with exclusive dedication in one place

 SSC

Large team geographically distributed



SAS CCB - SAS WG

- SAS Configuration Control Board (SAS-CCB): SCRs + important SPRs + CCF releases
 - » general SAS and PPS development
 - using SPR / SCR system + CCF system centralized at SOC

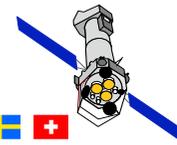
- frequent SAS Working Group (SAS-WG) web-conferencing

- > maintaining the cohesion of the SAS developers / maintainers
- > helping to solve problems faster than just using SPR / SCR system
- > finding areas with less / almost no support

8 SAS WG web-conferences in 2010 + 1 meeting (@SSC Cons.)

In addition, dedicated WG » 2D PSF working group

- shortcomings due to other priorities by SSC institutes with SAS maintenance
 - » shadow maintenance - done with Saclay for a year, intended with MPE now
- preparing the pipeline transfer to SOC due to the "managed withdrawal" of UK-STFC support to XMM





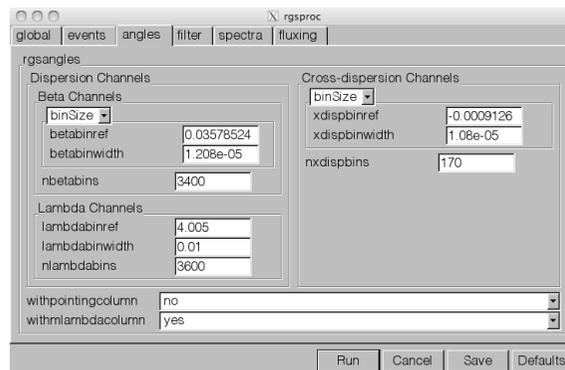
SAS package standard structure

Each package is created with a standard structure, including source, documentation, dependencies, gui parameters, test harnesses and accompanying data:

```

+--[package]--+
|
|  VERSION          (*)
|  DEPEND           (*)
|  ChangeLog        (*)
|  DISTRIBUTION     (*)
|  Makefile         (*)
|
+--[src]--+
|
|  Makefile
|  task1.cc
|  task2_mod.f90
|  task3.pl
|
+--[doc]--+
|
|  Makefile
|  task1_description.tex
|  ...
|
+--[test]--+
|
|  Makefile
|  task1_test
|  ...
|
+--[config]--+
|
|  Makefile
|  task1.par
|  task1.lyt
|  task1.info
|  package.info

```



XMM-Newton Science Analysis System

rgsproc (rgsproc-1.30.1) [xmmsas_20110223_1801-11.0.0]

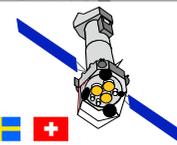
Parameters

This section documents the parameters recognized by this task (if any).

Parameter	Mand	Type	Default	Constraints
entrystage (global)	no	choice	1:events	1:events 2:angles 3:filter 4:spectra 5:fluxing
The stage at which to begin processing.				
finalstage (global)	no	choice	5:fluxing	1:events 2:angles 3:filter 4:spectra 5:fluxing
The last stage to process.				
withinstexpids (global)	no	boolean	false	
On true: only the specified list of exposures (parameter instexpids) are processed. On false: all Spectroscopy exposures are processed.				
instexpids (global)	no	list of strings		
List of instrument-exposure identifiers. These take two possible forms: a six-character string such as "R1S001" or the full name of any ODF file related to the desired exposure. Requires withinstexpids=true.				
orders (global)	no	list of integers	1 2	1 ≤ integer ≤ 6
Which reflection orders to process in the final two stages ("spectra" and "fluxing").				
withprefix (global)	no	boolean	false	
A prefix string begins the name of every file written to or read from the current working directory. On true: the specified prefix string (parameter prefix) is enabled. On false: the PPS prefix string is inferred from the ODF.				



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Daily SAS builds

Distributed development in heterogeneous
+ interdependencies + servicing large community
+ large use of many external libraries + ...

- >> A) Chaos or
- >> B) Continuous integration systems to S/W integrity

B was chosen

Several machines (different OS / flavours) building every night including harness tests, and uploading the results onto a web server

SAS integration result

Updated on: 2011-03-06T12:30:00. Reported by: sasbuild
Machine: xmacserver
Machine details: Darwin xmacserver 9.8.0 Darwin Kernel Version 9.8.0: Tue Aug 14 22:03:11 PDT 2011; root:xnu-1.0.0.2/~/RELEASE_ARM_T8020.100.1~1/RELEASE_ARM_T8020.100.1
Created on: Sat Mar 5 21:50:17 2011
Release: xmmsas_20110304_1803

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

Build of the SAS manifest: dmactrackun
Build configuration: dev

Failed
6 out of 234.

Color scheme

- ok
- compilation
- formal
- tests
- documentation
- compilation_tests

Details
Packages are listed by build order.

Package	ver	time	depehk	distchk	make depend	make bin	make doc	make tests	has tests	make test	re-test
omgrismplot	1.5.3	20:30	ok	ok	ok	ok	ok	ok	ok	ok	ok
newsiam	1.6	20:31	ok	ok	ok	ok	ok	ok	ok	ok	ok
msslib	2.62	20:31	ok	ok	ok	ok	ok	ok	ok	ok	ok
inhist	2.21	20:31	ok	ok	ok	ok	ok	ok	ok	ok	ok
implot	2.18	20:32	ok	ok	ok	ok	ok	ok	ok	ok	ok
Package	ver	time	depehk	distchk	make depend	make bin	make doc	make tests	has tests	make test	re-test
htrframes	1.2.2	20:33	ok	ok	ok	ok	ok	ok	ok	ok	ok
ftools	1.2	20:33	ok	ok	ok	ok	ok	ok	ok	ok	ok
evarimgen	0.8.1	20:33	ok	ok	ok	ok	ok	ok	ok	ok	ok
esrselect	3.2.1	20:33	ok	ok	ok	ok	ok	ok	ok	ok	ok
espfilt	1.0.4	20:33	ok	ok	ok	ok	ok	ok	ok	ok	ok
rmfgen	1.56.1	20:37	ok	ok	ok	ok	ok	ok	ok	ok	ok
especget	1.31.2	20:38	ok	ok	ok	ok	ok	ok	ok	ok	ok
eslewchain	1.5.1	20:39	ok	ok	ok	ok	ok	ok	ok	ok	ok
esky2det	1.12.1	20:40	ok	ok	ok	ok	ok	ok	ok	ok	ok
csas	0.9.12	20:40	ok	ok	ok	ok	ok	ok	ok	ok	ok
epsplitter	0.2.7	20:42	ok	ok	ok	ok	ok	ok	ok	ok	ok
timeappend	1.5	20:42	ok	ok	ok	ok	ok	ok	ok	ok	ok
epicccorr	1.7.2	20:42	ok	ok	ok	ok	ok	ok	ok	ok	ok
epevents	6.43	20:43	ok	ok	ok	ok	ok	ok	ok	ok	ok
emtaglenoise	1.0.4	20:43	ok	ok	ok	ok	ok	ok	ok	ok	ok
Package	ver	time	depehk	distchk	make depend	make bin	make doc	make tests	has tests	make test	re-test
emdiag	4.0.1	20:44	ok	ok	ok	ok	ok	ok	ok	ok	ok
hkgtigen	1.14.2	20:44	ok	ok	ok	ok	ok	ok	ok	ok	ok
gtimerge	1.7.2	20:44	ok	ok	ok	ok	ok	ok	ok	ok	ok
gtialgn	2.10	20:44	ok	ok	ok	ok	ok	ok	ok	ok	ok
evigweight	1.6	20:44	ok	ok	ok	ok	ok	ok	ok	ok	ok
evlistcomb	4.19.2	20:45	ok	ok	ok	ok	ok	ok	ok	ok	ok
emenergy	8.6.2	20:45	ok	ok	ok	ok	ok	ok	ok	ok	ok
emevents	8.4	20:45	ok	ok	ok	ok	ok	ok	ok	ok	ok
emeventsproj	1.5.2	20:46	ok	ok	ok	ok	ok	ok	ok	ok	ok
emframes	5.8.1	20:46	ok	ok	ok	ok	ok	ok	ok	ok	ok
embadpixfind	2.3	20:46	ok	ok	ok	ok	ok	ok	ok	ok	ok
ekstest	2.4	20:47	ok	ok	ok	ok	ok	ok	ok	ok	ok
efluxer	0.4.3	20:47	ok	ok	ok	ok	ok	ok	ok	ok	ok
edetect	1.3	20:47	ok	ok	ok	ok	ok	ok	ok	ok	ok
emldetect	5.15.2	20:48	ok	ok	ok	ok	ok	ok	ok	ok	ok
Package	ver	time	depehk	distchk	make depend	make bin	make doc	make tests	has tests	make test	re-test
ebadpixupdate	1.10	20:49	ok	ok	ok	ok	ok	ok	ok	ok	ok
emosaic	1.15.2	20:49	ok	ok	ok	ok	ok	ok	ok	ok	ok
ds9tomask	2.5	20:49	ok	ok	ok	ok	ok	ok	ok	ok	ok





ESAS in SAS is special

ESAS is a special package written (and maintained!) by SS @ GOF

composed out of:

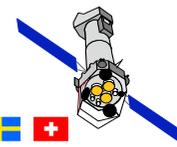
- 11 Perl scripts
- 19 F77 routines
 - "SASified" through F90 wrappers + C++ modules for I/F, GUI, etc

& using own Calibration Files (in ESAS-CALDB) as opposed to normal CCFs

* 1st release with SAS 9 for EPIC MOS >> upgrade in SAS 10 >> upgrade in SAS 11 including PN

Main points

- + standardized analysis for extended sources using best knowledge in field
- + fully (?) documented through "Cookbook" as analysis guide with some depth
- no central control of CCFs > changes at least problematic (but rsync'ed anyway)
- no automatic testing (no harness tests on different platforms) > validation cumbersome
- no use of CAL & probably lot of room for improving performance





SAS scientific validation

SAS validation exercise including thorough checking of new elements:

XMM-1

XMM-Newton Science Analysis

XMM-SOC-USR-1

C.Ga

14 Janua

Revision

Revision number	Date	Re
0.9	14 January 2011	

3.1 Validation schedule

The schedule for the validation foresees a period of 4 weeks for performing the different tasks. This is the projected schedule with the different milestones:

- SAS into release track mode - 15 December 2010
- SAS builds on different platforms - 10 January 2011
- SAS 11 binaries (at least 1 platform) - 14 January - [EO]
- Processing of all the standard datasets (32 bit + 64 bit subsets - finished - 14 January - [AI]
- Communication to validators about success and data location - 17 January - [CG]
- Installation of SAS 11 binary in XCal grid - 18 January - [EO]
- Preparation of testing pipeline finished - 21 January - [SR+DLG]
- Processing of standard datasets by testing pipeline - 24 January - [DLG]
- Processing of XCal archive - from 19 January to 21 January - [MG]
- First evaluation of XCal - to be ready by 28 January - [MG]
- first I/A analysis of standard data - to be ready by 28 January - [MG, AP, AT, PR, RG, AI, RDS, CG, ...]
- Dedicated analysis - to be ready by 11 February:
 1. 64-bit vs 32-bit data products comparison - [CG]
 2. EPIC 2D-PSF handling - [RDS]
 3. MOS redistribution - [MG]
 4. RGS Small Window mode - [AP]
 5. xmmextractor - [JUN]
 6. Upgraded ESAS (incl. PN) - [IdC]
 7. OM variability and photometry improvements - [AT]
- Summary reports due on 15 February - [All]
- Release notes + SAS 11 web pages contents ready - 16 February - [CG]
- SAS 11 distribution tarfiles ready - 16 February - [EO]
- SAS 11 release - 17 February
- Final SV individual reports - 3 March [All]
- Final SV Report compilation - 10 March [CG]

4 Validation results

5 Conclusions

- * all standard sets through "procs"-based scripts + PPS testing + xmmextractor
- * whole cross-calibration DB processed
- * slews processed
- * special observations added

Document No.: XMM-SOC-USR-TN-xxxx
 Issue/Rev.: 0.9
 Date: 14 January 2011
 Page: ii

1 Center

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low mode treatment 4

is handled in ESAS 4

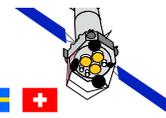
the successor of psechain 4

otometry improved both for crowded-fields as for 4

..... 5

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..... 5

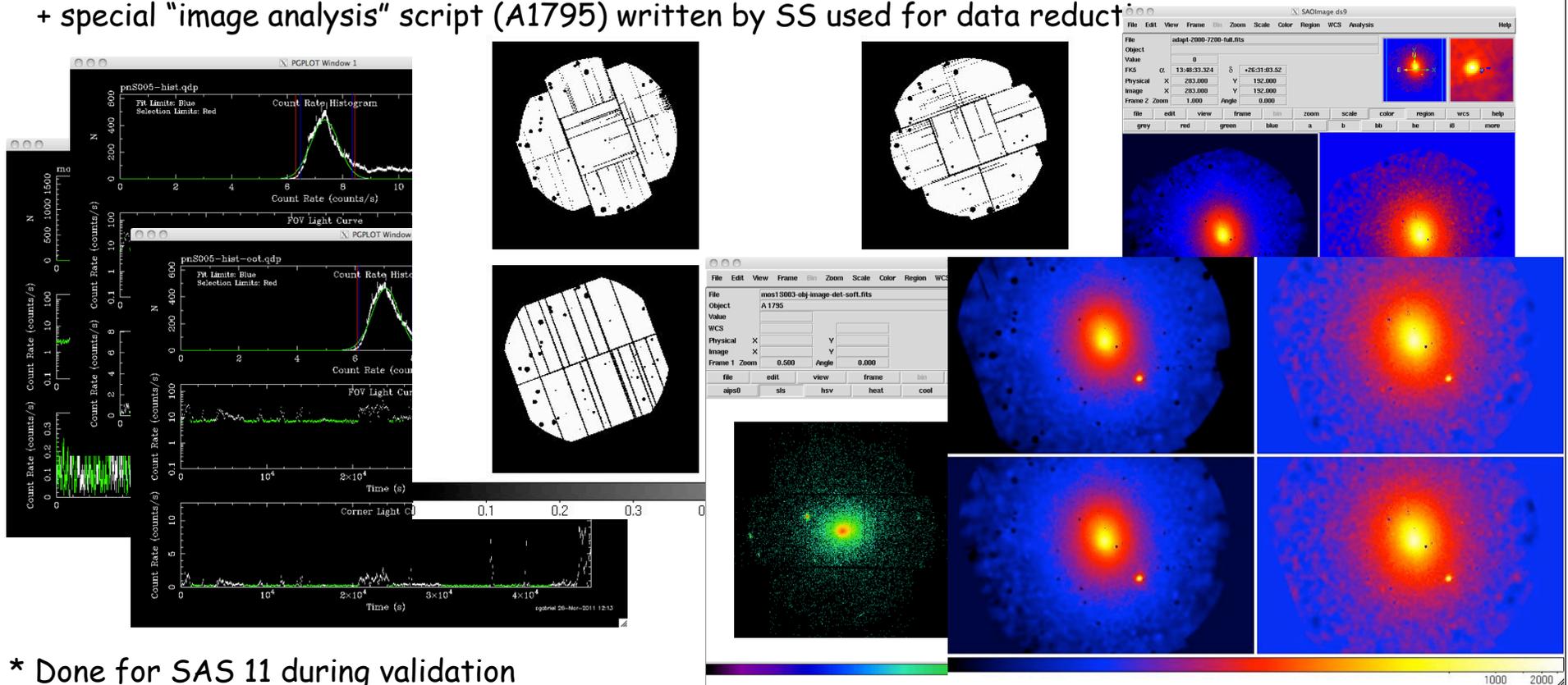


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SAS-ESAS scientific validation

ESAS is tested

* using a standard observation, follow all the steps as proposed in the "Cookbook for Analysis Procedures..." + special "image analysis" script (A1795) written by SS used for data reduction



* Done for SAS 11 during validation

but "Last minute" change on **emask** was not sufficiently tested using ESAS software



SAS-ESAS validation 2.0

- » change of **emask** discovered to break **ESAS** software after SAS 11 release (by SS)
 - » **ESAS** upgraded promptly by SS + **esas-caldb** upgraded at same time (no public info on this)
 - » after re-validation testing (on Linux machine) SAS 11.0.1 patch released
- ... a week after » tests on MacOS (Snow Leopard) show **problems** with **ESAS-swcx** (**seg faults**)
(I recall: SAS 11.0 = binaries for 15 platforms + 2 VMs !)

My conclusions:

- we need to make ESAS tasks MORE "SAS conform", including **harness testing**
 - » re-writing everything in C++/F90? BP announced in Santander to be working on this
- big effort by KK (+ others at GOF?) for a reduction of calibration files (122 » 25 !!, 2.8 GB » 1.4 GB !!)
 - » should be followed by **real conversion to CCFs**, to be put under Configuration Control of SAS CCB
 - » use of DAL / CAL?
- need of a "thread" (SS on it)

But: SOC is manpower limited - priorities in other areas (see CG on SAS tomorrow) + taking over more and more tasks (natural evolution)

