SVOM General Program and ToO
QUICK LOOK ANALYSIS

A. Goldwurm (APC / CEA)

Documents:

SVOM GP/ToO SDP (SR4)	**(SV-SY-SP-556-JPO)**
FSC GP/ToO SDD	(SV-GSF-SP-702-CNES)

Motivations for QLA

Scientific Motivations of the QLA (in addition to the CP BA activities)

- HE sources are all wildly variable and even transient (W. Yu & J. Rodriguez talks)
  - **AGN particularly Blazars, TDE**
  - **Galactic (or LMC/SMC) BH and NS LMX (Bursters, ms BPS, …)**
  - **HMXB and SFXT**
  - **Magnetars, AXP**
  - **Time domain astronomy, Multi-Messenger Astronomy**
- On timescales very different: yr / months / days / min / sec …
- SVOM role of H-E variable sky monitor for the next decade
- Trigger SVOM (space / ground) ToO observations on special events (new sources)
- Trigger obs. with external observatories: CTA (Blazars), ELT, …
- Alert the community (ATEL)

BUT …. What is QLA ?

SIGMA/GRANAT QLA

Circular No. 5201

Central Bureau for Astronomical Telegrams
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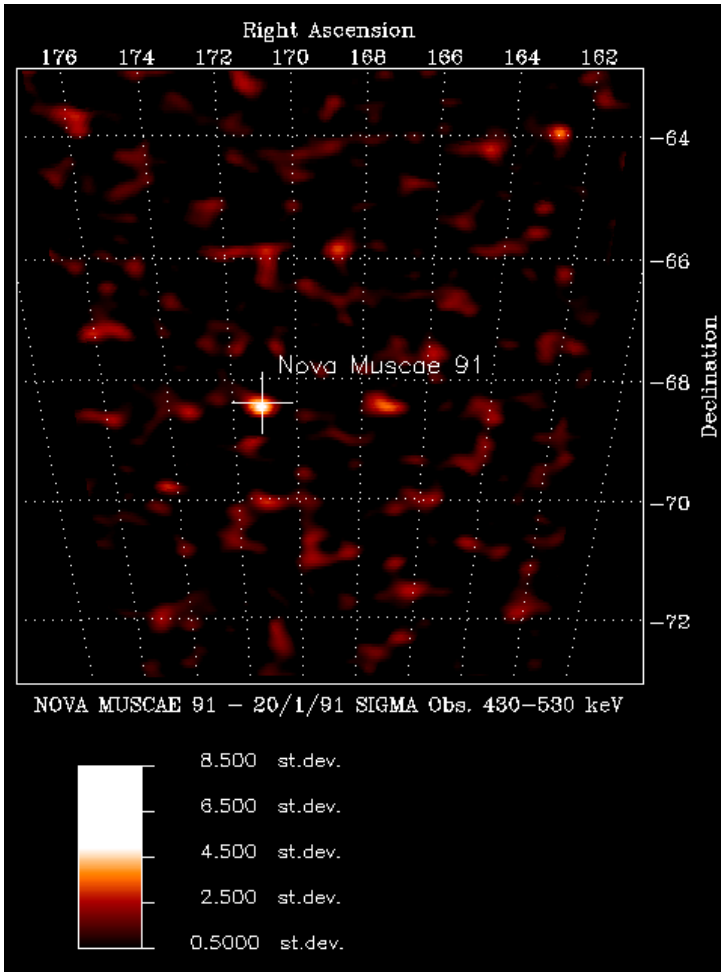
NOVA MUSCAE 1991

R. Sunyaev, E. Jourdain and A. Goldwurm on behalf of the SIGMA/ GRANAT Team (Space Research Institute, Moscow; Service d'Astrophysique, Centre d'Etudes Nucleaires de Saclay; Centre d'Etude Spatiale des Rayonnements, Toulouse) report: "Further analysis of the Jan. 20-21 observation of Nova Mus 1991 (GRS 1124-684) with the SIGMA telescope onboard GRANAT has shown that the transient spectral feature reported on IAUC 5176 is compatible with a line near 500 keV. The line width is consistent with the instrument spectral resolution (about 40 keV at 500 keV). The line flux is about 3 x 10E-3 photons sE-1 cmE-2. A clear excess (4.5 standard deviations), compatible with the optical position of Nova Mus 1991, is visible in the image derived in the 470- to 550-keV band during last 16 hr of observation (i.e., when the line was detected). The line was not detected during the first third of the 24-hr observation, nor during the next 24-hr observation of this source on Feb. 1-2."

1991 BB

Ephemeris from orbital elements on MPC 17833:

1991 ET	R.A. (1950)	Decl.	Delta	r	V
Feb. 28	5 44.09	-24 55.9			
Mar. 5	5 36.58	-26 06.7	0.573	1.192	17.2



INTEGRAL QLA

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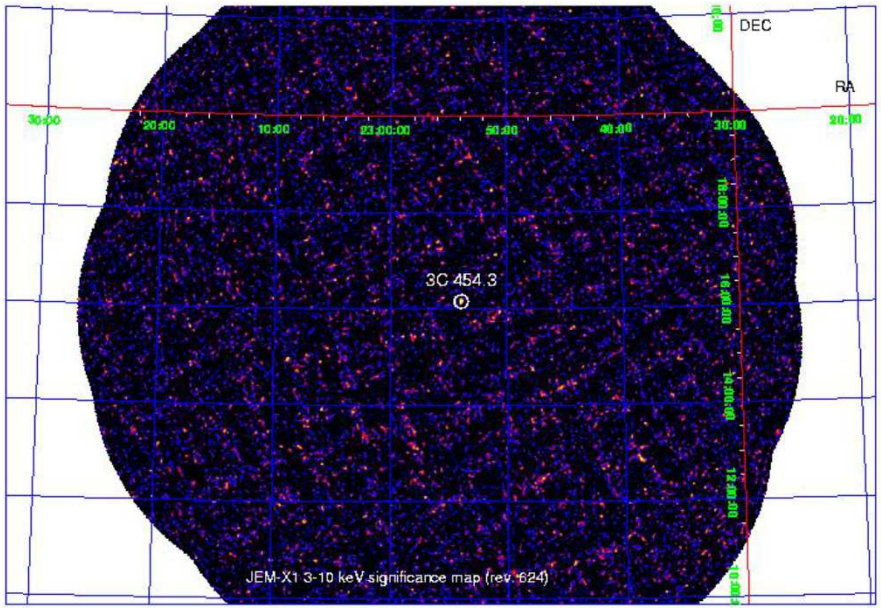
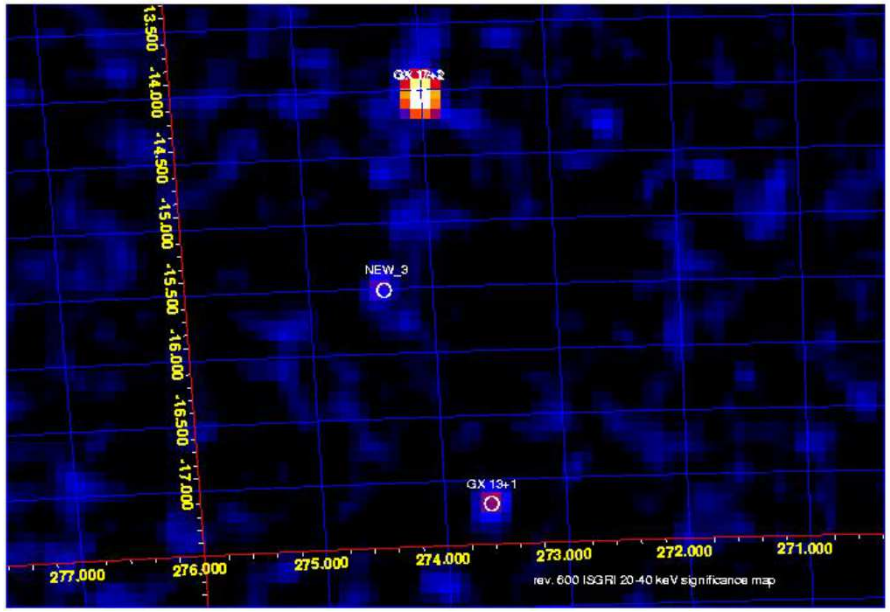
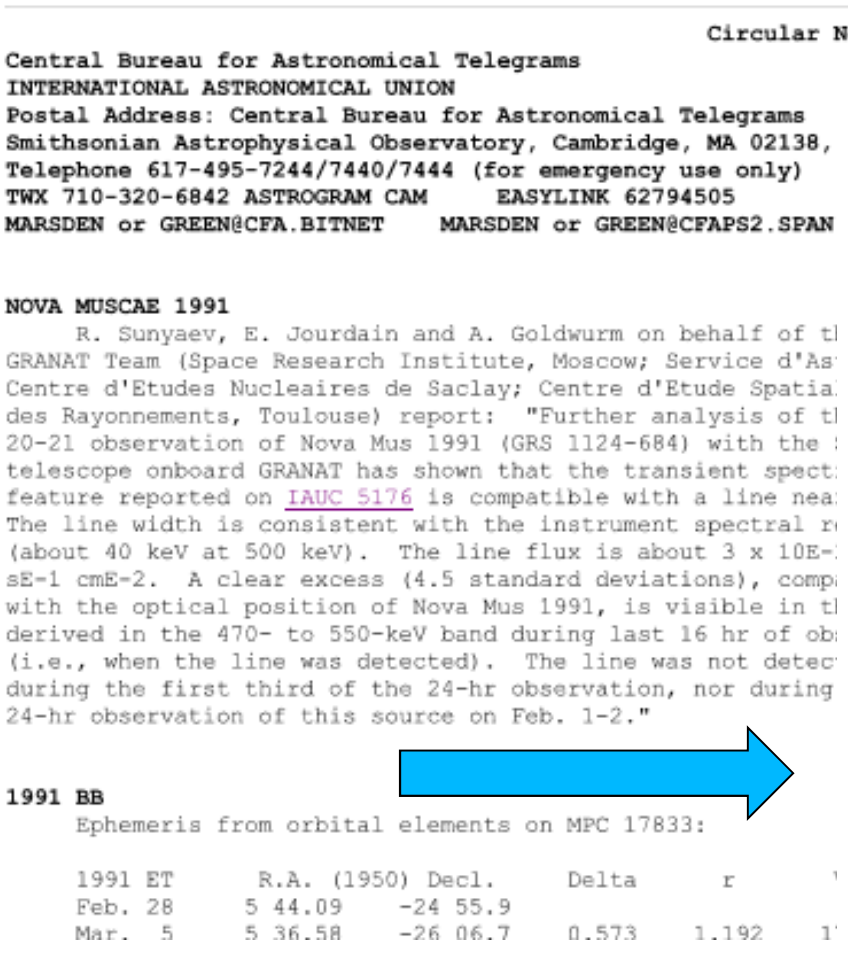




- NRT pipeline including some instrument monitoring in order to define robust GTI and alert for instrumental problems
- Images in 2 energy bands for 2 instruments out of 4, in scw (30 min) and mosaic images built over ~ 100 ks (1 day), comparison with catalogues => new source ?
- If detection: spectra and LC in coarse bins, check previous and following data
- On-duty Scientist => check results, performs some specific analysis => alerts

From IAUC to ATEL



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NOVA MUSCAE 1991

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17 May 2018; 09:54 UT

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Combine With:
(Show All) AND OR
Radio
Millimeter
Sub-Millimeter
Far-Infra-Red
Infra-Red
Optical
Ultra-Violet
X-ray
Gamma Ray
>GeV
TeV
VHE
UHE

Telegram Index

Telegrams Posted Within the Last 30 Days (All)
112 Selected of 11649 Telegrams

11649	Discovery of [Fe X] and super-soft X-ray emission from the gamma-ray nova ASASSN-17mt (Nova Vel 2017)	K. L. Page, F. M. Walter, N. P.M. Kuin, J. P. Osborne *17 May 2018; 07:55 UT*
11648	Spectroscopic classification of AT2018avk as a likely SLSN I	Matt Nicholl, Sebastian Gomez, Peter Blanchard, Edo Berger *16 May 2018; 20:47 UT*
11647	Early VLA and AMI-LA Radio Detections of the Nova V392 Per	J. D. Linford, J. Bright, L. Chomiuk, R. Fender, A. van der Horst, A. Mioduszewski, J. Sokoloski, M.... *16 May 2018; 18:21 UT*
11646	VLA & Swift Observations of Liller 1 Indicate CXOU J173324.6-332321 is Likely a Neutron Star X-Ray Binary	Arash Bahramian, Alexandra Tetarenko, Gregory Sivakoff, Jay Strader, Laura Chomiuk, Craig Heinke, James... *16 May 2018; 14:15 UT*
11645	Recent optical observations of NHATS target 2015 DP155	V. Reshetnyk, V. Godunova, O. Sergeev, A. Simon *15 May 2018; 21:05 UT*
11644	Fermi LAT detection of renewed and strong GeV gamma-ray flares from blazars PKS 0903-57 and PKS 0346-27	Stefano Ciprini, on behalf of the Fermi Large Area Telescope Collaboration

ATELstream

Recently
11642 Spectroscopic Classificatior of Optical Transients with SOAR
Y.-C. Pan...
11630 Spectroscopic Classificatior of Optical Transients with Gemini-North
Y.-C. Pan...

Most Viewed
11648 Spectroscopic classification of AT2018avk as a likely SLSN I
Matt Nicholl...
11646 VLA & Swift Observations of Liller 1 Indicate CXOU J173324.6-332321 is Likely a Neutron Star X-Ray Binary
Arash Bahramian ...
11647 Early VLA and AMI-LA Radic Detections of the Nova V392 Per
J. D. Linford ...

Supernovae
11648 Spectroscopic classification of AT2018avk as a likely SLSN I
Matt Nicholl...
11643 Spectroscopic Classificatior of SNe ASASSN-18hq and 2018ass with the 2.5-m du Pont Telescope
Subhash Bose ...
11642 Spectroscopic Classificatior of Optical Transients with

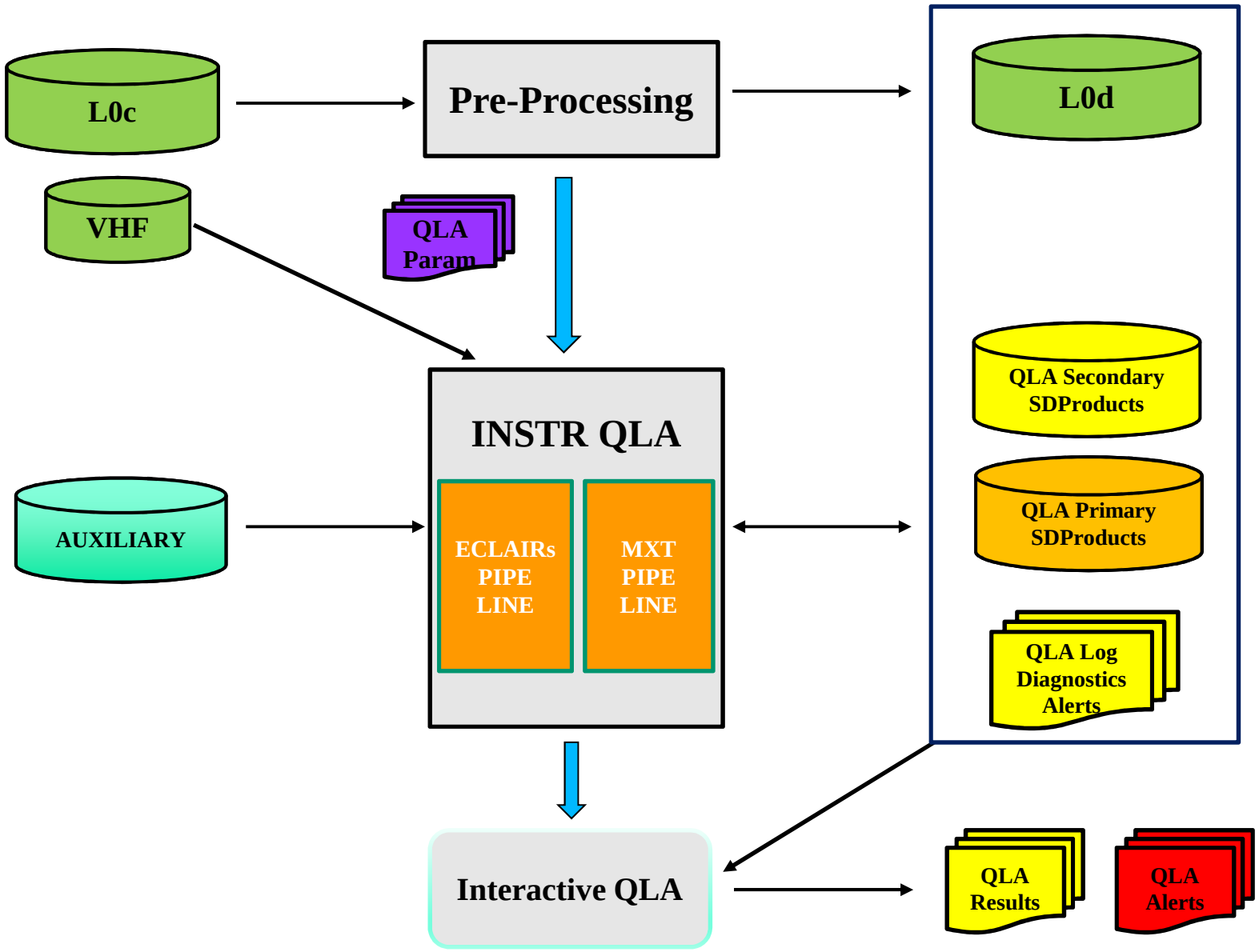
SVOM QLA

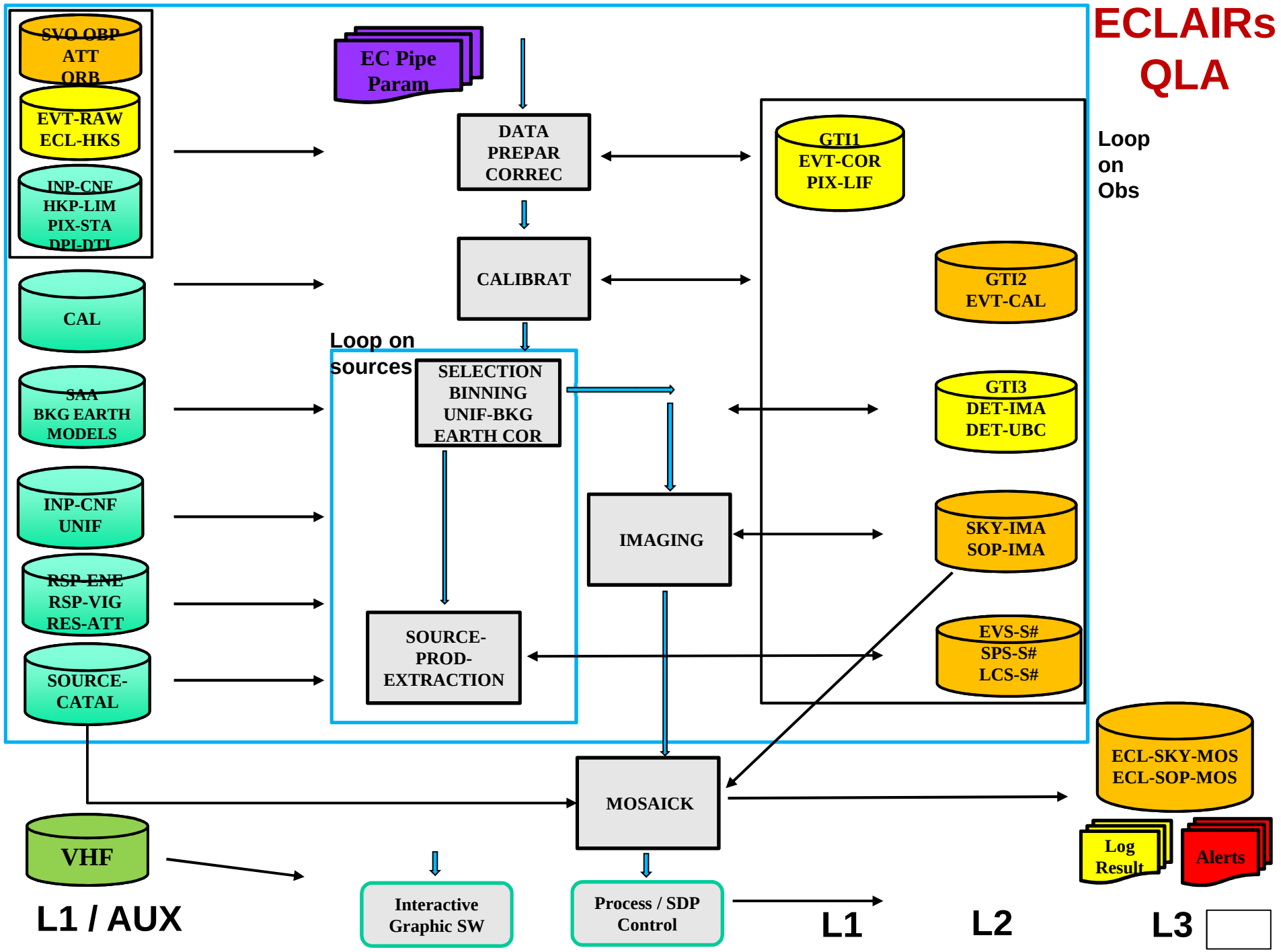
- Goals:
  - Search for new sources / transients, provide position and fluxes
  - Detect large state changes of the target source
  - Provide preliminary data products (ToO): images, spectra, light curves
- When: regularly, all the time not just at GRB triggering or ToO
- Time scale: 1-3 days (not real time, not at each download)
- Which Data:
  - Wide field instruments (ECLAIRs)
  - Narrow field instruments MXT /VT for the target source
- Processing:
  - Automatic and Fast
  - Robust (not all information / data may be available)
- Who: SVOM teams (shifts, coordination needed)
- How: Using GP Pipelines and associated Interactive Analysis software

ECLAIRs QLA: Steps

- TM (X-band) Preprocessing => data conversion and preparation, some checks on attitude/orbit from TM, comparison to plan
- Technical analysis of instrument parameters and check obs. conditions (SAA, bkg, solar flares) => GTI
- Corrections and energy calibration of events
- Imaging:
  - ⇒ Selection, binning, background correction, Earth Occultation corrections
  - ⇒ Sky reconstruction, cleaning, source detections & identification
- Source Products Extraction (limited to new source / target, tbc)
  - ⇒ Spectra
  - ⇒ Light Curves
- Combining some products: image mosaics, spectra, LC
- Interactive analysis, display tools, comparison with VHF data
- QLA scientist: checks, reports, alerts

GP QLA


L0c
Pre-Processing
L0d
VHF
QLA Param
QLA Secondary SDProducts
INSTR QLA
AUXILIARY
ECLAIRs PIPE LINE
MXT PIPE LINE
QLA Primary SDProducts
QLA Log Diagnostics Alerts
Interactive QLA
QLA Results
QLA Alerts
Input
Process
Output / Input


ECLAIRs
QLA
Loop
on
Obs
SVO OBP
ATT
ORB
EVT-RAW
ECL-HKS
INP-CNF
HKP-LIM
PIX-STA
DPI-DTI
CAL
SAA
BKG EARTH
MODELS
INP-CNF
UNIF
RSP-ENE
RSP-VIG
RES-ATT
SOURCE-
CATAL
EC Pipe
Param
DATA
PREPAR
CORREC
CALIBRAT
Loop on
sources
SELECTION
BINNING
UNIF-BKG
EARTH COR
SOURCE-
PROD-
EXTRACTION
IMAGING
MOSAICK
GTI1
EVT-COR
PIX-LIF
GTI2
EVT-CAL
GTI3
DET-IMA
DET-UBC
SKY-IMA
SOP-IMA
EVS-S#
SPS-S#
LCS-S#
ECL-SKY-MOS
ECL-SOP-MOS
Log
Result
Alerts
VHF
Interactive
Graphic SW
Process / SDP
Control
L1 / AUX
L1
L2
L3

Work Plans and Open Issues for QLA

Plans:

- Prepare Pipelines: same as SA pipeline but with specific approximations and parameters adapted to QLA goals
- Define and prepare IA tools
- Define procedures, alerts, etc.
- Optimization with respect to CP/BA and ToO_MM

Issues:

- Is VT concerned ? GRM ?
- Coordinate with GFT GWAC => depends obs. (e.g. ToO target)
- Coordination with BA, ToO-MM operations, tools and teams