

# Introduction : Requirements on High Level processing

Fabien Grisé

Observatoire de Strasbourg



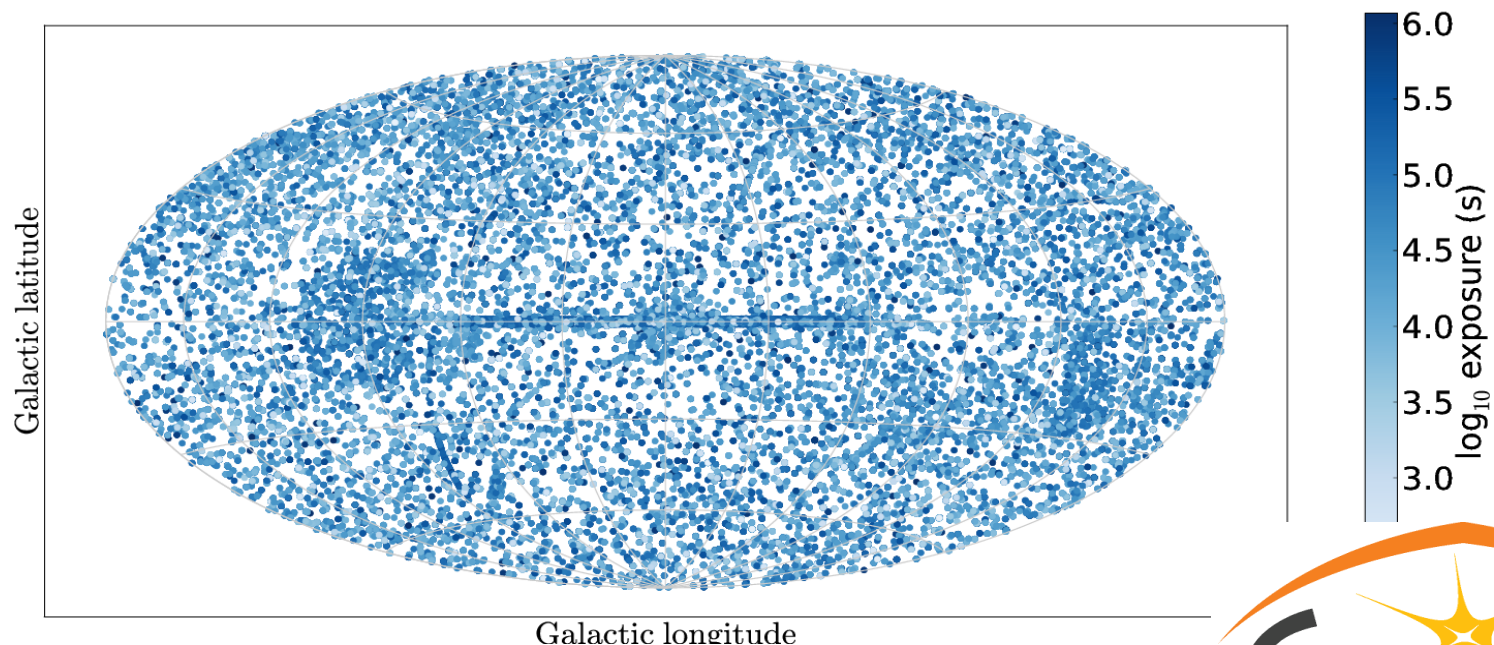
# Requirements on High Level processing

- Two types of « basic » processing
  - Near real-time : quicklook data analysis
    - Basic data reduction needed for first look
    - Timescales ~ 6—12 hours (downlink) up to 1—2 days
    - **Necessary for transient events** – « Just » a by-product of the reduction process
    - **What to do with this information?** Issue a VOMessage? Trigger ground-based telescopes?
    - Who actually decide?
  - « Standard » pipeline
    - Timescales much longer – typically ~ week(s) for final products to be processed (e.g. Swift/XRT)
    - Source catalogues (implying complete reprocessing)



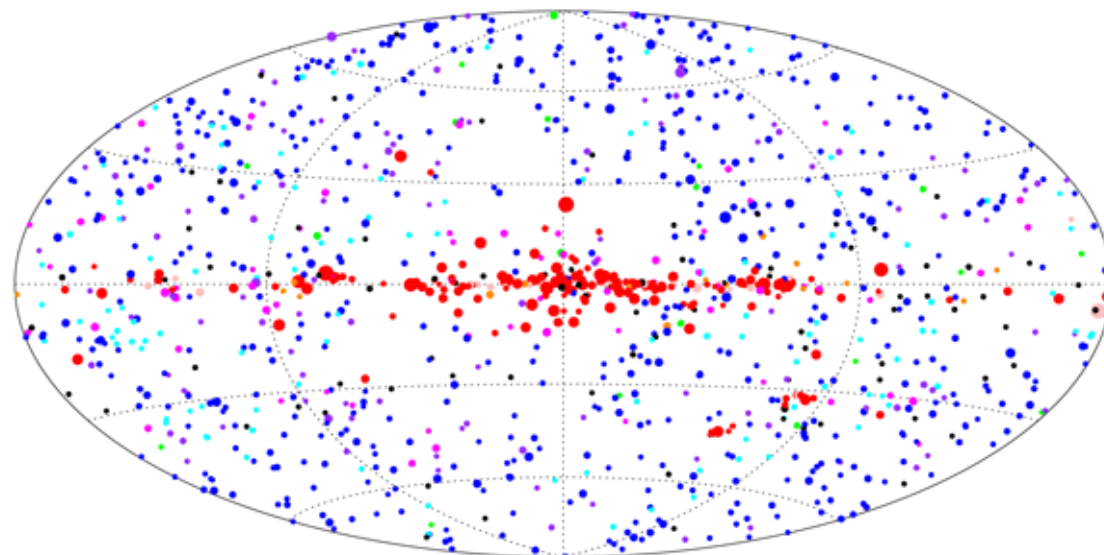
# Learning from past/current missions

- INTEGRAL/XMM-Newton (yesterday)
- Swift (closest to SVOM)
  - 1SXPS Catalogue (Evans et al. 2014) : refined XRT source catalogue (151 524 sources) with **timing** properties (**on different timescales**, 30000 variable sources!), **cross-correlation** with other catalogues.



# Learning from past/current missions

- Swift (continued) :
  - BAT (14-195 keV) 70-month hard X-ray survey (1171 hard X-ray sources associated with 1210 counterparts), lightcurves, ...



● Unidentified    ● Galaxies    ● Seyfert Galaxies    ● CVs/Stars    ● X-ray Binaries  
● Galactic    ● Galaxy Clusters    ● Beamed AGN    ● Pulsars/SNR

# Learning from past/current missions

- Swift (closest to SVOM)
  - First Swift/BAT catalog published in 2005 (first 3 months), Markwardt et al. 2005
  - Second Swift/BAT catalog published in 2010 (first 22 months, **2004—2006**), Tueller et al. **2010**; 6 years after launch
  - First full point source XRT catalog only published in 2011 (D'Elia et al.) ; 7 years after launch (manpower/funding at this stage?)
    - **Need for software/calibration maturity first** (as said yesterday)
    - « Let's not define too many goals! » (Volker)



# Requirements

- Prior requirements :
  - **Excellent data/product quality** (source positions, (multi-band?) lightcurves, spectra ...)
- High-Level processing (Identified WPs) :
  - Source IDs and correlation with catalogues (C. Motch)
  - Multi-wavelength aspects (IRAP/OAS work packages) :
    - SED of SVOM sources, using SVOM and ground data.
    - Near real-time capability to check for multi-wavelength counterparts to a detected source by ECLAIR → similar to XMM ACDS processing (finding charts) and XMM-Newton catalog processing (but in real-time)?
    - MXT ground trigger (VOEvent messages in case of a TDE, flare/super-flare ...) with additional benefit of creating a dynamical MXT source catalog (updated on the fly?)



# Requirements

- High-level processing (others) :
    - Timing analysis (C. Gouiffes)
    - Virtual Observatory (L. Michel)
- to be included in work packages?
- products VO-compatible?



# Long-term survey?

- Which strategy? (with input from C. Adami)
  - B1 pointing deviations might allow for significant observing time towards the Galactic plane.
  - Ground segment and multi-wavelength preparation?
  - Synergies available early 2020s : LSST, early SKA, LIGO, ...
  - Timescales necessary to trigger SVOM (MXT) on interesting transients. Semi-automated? LSST will issue tens/hundreds of thousands alerts per day → How to decide ? **Need for a « Transient board/committee »?**
  - Advance planning necessary

