User Support and Mission Planning

XMM-Newton Users’ Group Meeting 19
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Matthias Ehle

On behalf of the Community Support & Scientific Planning Team (a.k.a. USG):
Lucia Ballo, Ignacio de la Calle, Jacobo Ebrero, Rosario González, Nora Loiseau,
Simone Migliari, Jan-Uwe Ness, Pedro Rodríguez, Laura Tomás
Special Events: Mission Planning (1/2)

Merger of XMM-Newton/INTEGRAL & Gaia Spacecraft Controller (SPACON) teams: (cf. talk by M. Kirsch)

- Close interactions with MOC
- New version of on-call Scientist Target-of-Opportunity (ToO) procedure:
  - SOC to check and avoid conflicts with Gaia & INTEGRAL critical activities, if possible.
  - ’Manual’ activities of SPACON reduced to very minimum (swap of current timeline to ToO timeline)

Possible impact (worst case): rejection of new timeline, later start of ToO (TBC)

- Some losses observed since start of merger operations (April 11):
  - ~10 OM exposures, some intended for fast UV monitoring (simult. HST)
  - One ToO lost: incorrect recovery after slew failure - new procedures
  - One 100 ks observation lost - new procedure for radiation: Ops-analyst needed for restart
  - ~30 ks MOS time lost from high priority coordinated HST obs. - new procedure for radiation
  - One pn exposure lost – idle after telecommand failure: Ops-analyst needed for restart
Special Events: Mission Planning (2/2)

Merger of XMM-Newton/INTEGRAL & Gaia Spacecraft Controller (SPACON) teams:

**Additional Check during Short-Term planning** (ToOs & ‘normal’ planning):

- **Identify** critical Gaia or INTEGRAL windows (output de-conflicting tool) & **display** them in Planning Tool.
- If possible, move XMM-Newton on-board transponder swap window to **avoid clash**.
- Otherwise: issue **early warning** on windows clash.
Scientific Mission Planning: Re-scheduling/Re-Planning

~53% of AO-16 Revolutions re-scheduled
(cf. AO-15: 46%, AO-14: 51%, AO-13: 45%)
**Scientific Mission Planning:**
**AO-17 Proposal Enhancement**

**Statistics on AO-17 Enhancement by USG Scientists**

- After phase II deadline (Feb 2) and in time for AO-17 start (May 1 minus 6 weeks): OTAC consistency, technical checks, optimization, constraints,…
- Number of proposals: 165; number of observations: 589
- Observation priorities: 250 A+B, 284 C and 55 anticipated ToOs
- More to come from:
  - Joint Programmes (Chandra, HST, INTEGRAL, NuSTAR, VLT): technical evaluation for their TACs & enhancement of accepted observations
  - Routine Calibration Observations
  - Unanticipated ToOs
Scientific Mission Planning: AO-17 Proposal Enhancement

~30% of AO-17 observations are time constrained:

- Fixed Time: cadence, orbital constraints, (excl 1st ToO triggers) 33%
- Position Angle 32%
- Coordinations 47%
- HST 7%
- VLT 10%
- NuSTAR 13%
- Swift 2%
- Chandra 3%

Note: several observations with multiple constraints
Scientific Mission Planning: Evolution of Coordinated Observations
Scientific Mission Planning:
Status of the Observing Program

Statistics up to the end of revolution 3370 (5 May 2018)

- **Open Time Programs AO-1 ⇒ AO-15** finished

- **Open Time Program AO-16** (May 2017 – end Apr 2018):
  - Number of successfully observed targets (A+B): 381 (94.3%)
  - Successfully observed cumulative exposure time (A+B): 14456 ks (94.5%)
  - Number of successfully observed targets (C): 150 (49.3%)
  - Successfully observed cumulative exposure time (C): 4025 ks (39.6%)

- **Open Time Program AO-17**: Just started...
Scientific Mission Planning: Extra ‘Scheduling Constraints’: Radiation

- **Radiation impact**: instruments need to be closed/saved
- Previous solar maximum peaked ~2014 (Cycle 24: lowest recorded sunspot activity)
- **USG community support**: monitoring radiation behaviour & making it public (XMM-SOC-GEN-TN-0014; updated annually, linked on AO-page & in UHB)

Effects of solar activity:
- Exposure time lost (X-ray instruments stopped during high radiation)
- Note: quiescent background higher with less active Sun – but beware of flares...
- Monitor closely what is lost, esp. critical targets needing fast re-scheduling.
XMM-Newton Science Archive (XSA): Content

- ODF/PPS of ~ 13,600 pointed observations
- ~863,000 EPIC PPS sources, ~9,756,000 OM PPS sources, ~17,000 Slew Survey PPS sources
- SDF of ~4,000 Slew Survey observations (rev.>3137)

- 775,153 EPIC Catalogue detections (3XMM-DR8 catalogue)
- 6,880,116 OM Catalogue sources (OM-SUSS3 catalogue)
- 72,352 Slew Survey Catalogue sources (XMMSL2)

- Ancillary info: proposal info, publications (>5600!), etc.
XMM-Newton Science Archive (XSA): New Functionalities (through 7 releases)

- On-the-fly data analysis via RISA, using JS9 image viewer
- New EPIC PPS source products
- Access to Radiation Monitor data
- Moving targets products in their reference frame
- Links to ESASky from EPIC and OM sources
- Publications using Slew observations
- bibcode link to observations, from ADS.
XMM-Newton Science Archive (XSA): Plans
for future XSA releases (main items)

**Content:** ingested when available, e.g.:
- EPIC Stacked Catalogue
- Include Response Matrix files in the PPS source files
- Improved PPS products, if relevant.

**Technical:**
- Improved results display for searches on a list of targets
- Integration of **upper limit server** (ULS) tool
- ADQL interface for direct (TAP) queries to the DB
- EPIC and RGS **spectra visualizer** (BiRD)
- More RISA data analysis options
- Migration of XSA accounts to ESA Cosmos.
XMM-Newton Science Archive (XSA): Usage Statistics

via User Interface (UI) or command line downloads (AIO) (Table Access Protocol (TAP) queries not included)

Active users are defined as users that do at least one of the following actions:
- Download ODF/PPS
- Open postcards and save the FITS from that window
- Send data to other VO tools (Topcat, Aladin, ...)
- Save table of results
- Use SIAP protocol to find/retrieve images

XSA Active Users

Volume of XSA data downloaded per month (GB)
Scientific Conferences & Workshops

Conference Local Organization
USG: Chair(s) & Members of Local Organizing Committees

Major International Symposium every 3 years (5 done):
  • The X-ray Universe 2017, Rome, 6 - 9 June 2017
    334 registered participants, legacy web page available

Annual Dedicated Workshops @ ESAC (8 done)
  • Time-Domain Astronomy: A High Energy View, 13 - 15 June 2018
  • Abstract submission: oversubscribed by ~1.4; authors informed April 16
  • 101 registered participants as of May 11, and still counting...
XMM-Newton Science Archive (XSA):
Planned display for the EPIC Stacked Catalogue
XMM-Newton Science Archive (XSA):
Availability of Radiation Monitor Files
XMM-Newton Science Archive (XSA): Interactive Data Analysis (RISA)