EPIC operations status 2018

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ESAC
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Issue/Revision: 1.0
Reference:
Status: For Information Only

xmm-newton
European Space Agency

Routine Operations

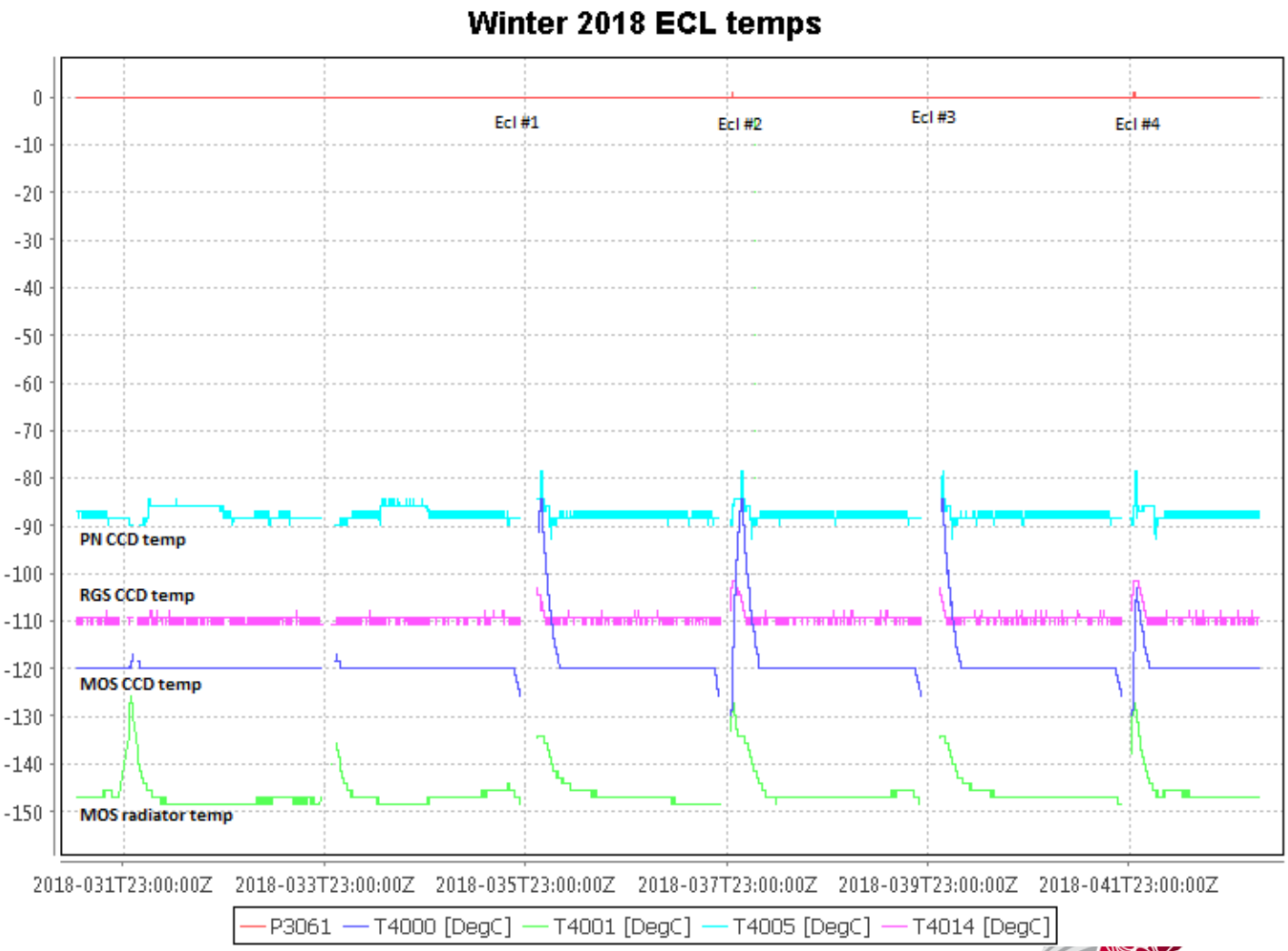
- Science observations
  - See the Quarterly Reports at the XMM SOC web
  - http://www.cosmos.esa.int/web/xmm-newton/quarterly-status-report
- Calibration observations
  - See the rest of presentations of this meeting ;-)
- Routine maintenance
  - RBI clocks resync on 31st May and 12th December. All nominal wrap-around.
  - ODB 7.0 (Nov 2017) and 7.1 (Apr 2018).

Eclipses

- A lot of eclipses (51)
  - The evolution of the orbit cause that now we have a lot of eclipses of relative short duration (~45 minutes as maximum).
  - But the evolution of the operations (ground stations, PSF stop too near…) cause that the instruments are powered OFF for a longer period (2 hours is typical)

- So the MOS CCD temperatures change a lot
  - First go 10 degC down (pre-eclipse cooling, commanded)
  - Then go ~50 degC up (when the instrument is off and PN CCD temp need to be maintained)
  - Finally it returns to nominal (when the instrument is powered again, and configured).

Eclipses (cont.)



Events

- Almost nothing…

- PN switched OFF by Auto Command safety on 9th June 2017.

- MOS ‘no eclipse’ lead to observing at -130 degC, and with the electronic boxes hotter than nominal (4th and 5th Sep 2017, rev 3249).

- PN quadrant sw crash and autoreboot on 15th January 2018.

Developments – Merge with Gaia

- XMM-Newton operations are being modified.

- Now we are going to have 1 space craft controller (24/7) for 3 space crafts (XMM, Integral & Gaia).
  - But they are trained only on platform, no on instruments.
  - They only may put the instruments on SAFE, if required.
  - And Gaia operations have priority over XMM

- For operate the instruments (of all the space crafts) is created a new position, the Ops Analyst
  - But is only one person, working on normal office hours.

- So we adapt….

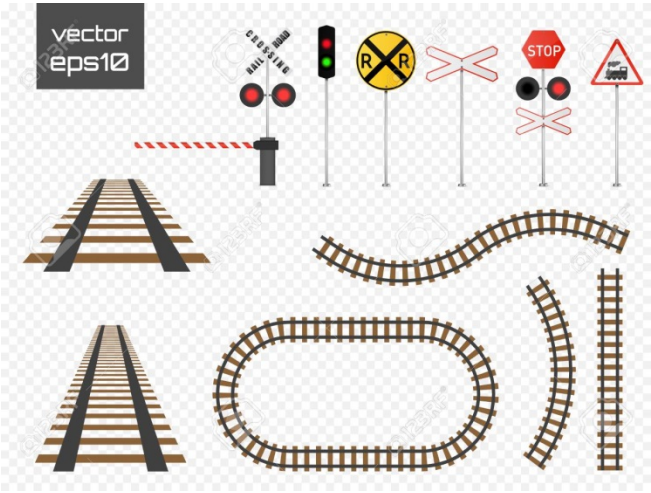
Merge with Gaia (2)

- Operations must continue…
  - but lost scientific time is accepted.

- Target: lost time until the end of the affected observation, no until the next working day.

  - Automation,
  - resilient timeline,
  - auto re-join

- Some level of Auto safe



Automation

- Auto Safe:
- If a housekeeping parameter (voltages, currents, temperatures) go out of limits, do not wait for the Spacon and power OFF the instrument.
  - If the affected is PN EPEA, go to Safe Standby (that power off only the EPEA and CCDs)
  - Do not trust to the MOS parameters from the EMCR A/D converted that became corrupted in the pass !
    - But automate a ‘corruption level’ meter for manually decide if they are corrupted.

- Radiation protection:
  - *Auto re-join (instead of safe-and-wait)*
  - MOS to Cal_Close, same mode
  - PN observing go to Idle, Close
  - PN being configured go to Cal_Close, same mode.

Time Line Resilience and Auto Rejoin

- The problem is that the new Spacons do not operate the instruments.
- So, if the timeline is disabled no science is performed

- The solution is no stop the time line, or re-start it at (almost) any time.

1. MOS and PN Activities (T/L observations TCs) are modified for allow start or end a T/L observation event if the instrument is in any other usual mode.
    - We can re-enable at any moment (except into the obs activation) and the T/L TCs will set the instrument on the required mode for the next observation.

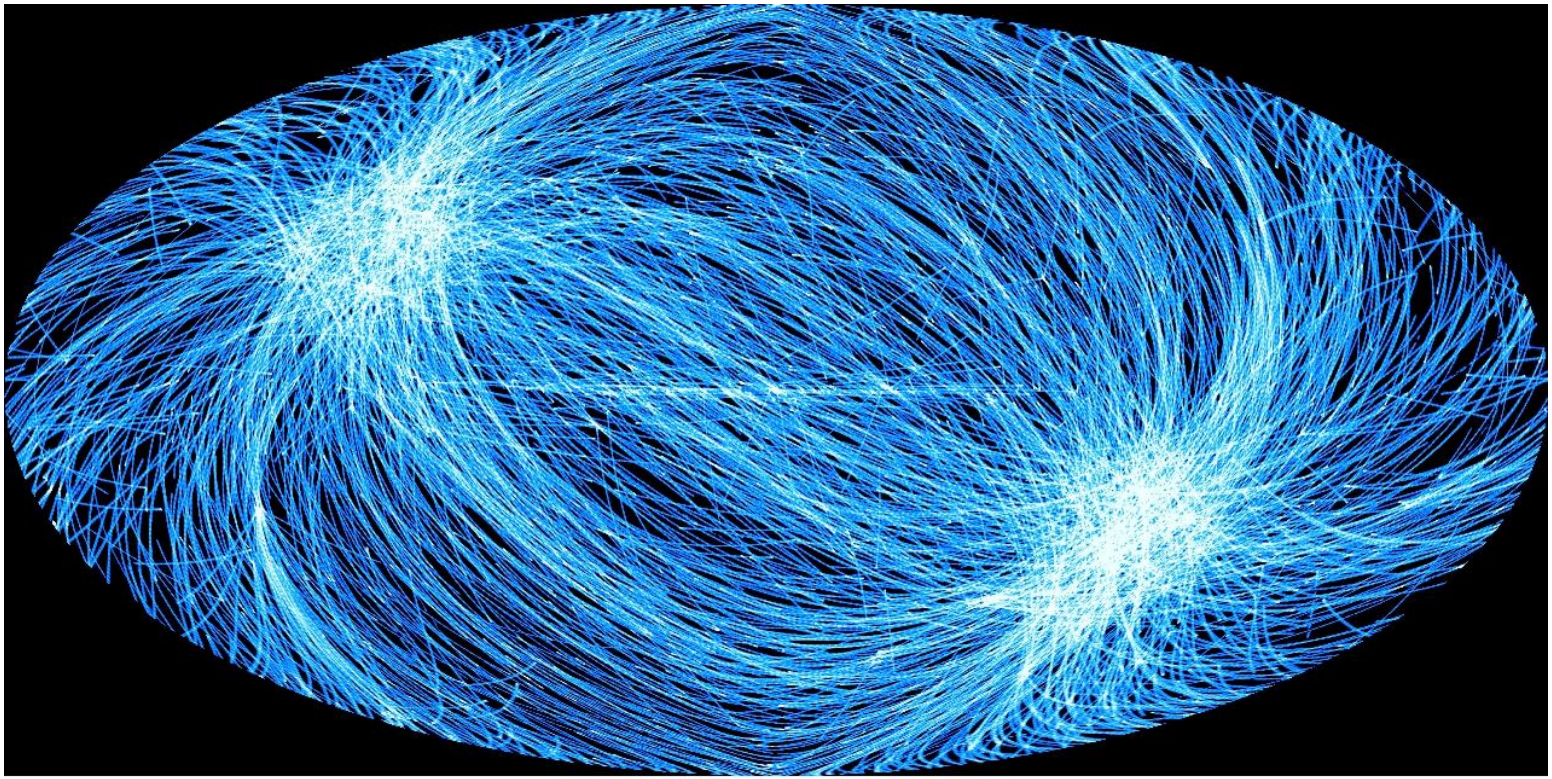
2. Deactivation (and Activ.) cover more possible starting cases
    - Redundant re-configuration (to be sure).

Other automations

- PN avoid wrong OT
  - If the conditions are not meet (mainly stable pointing), the Offset Tables are not allowed to be calculated in an automate (PTV) way
    - But a slew failure may end on a full obs lost.
    - For ODB 7.2 (July?) the recovery will be semi automatic

- BRAT change from Mission Planning
  - Introduce the BRAT changes into the Mission Planning system avoid the manual intervention of the Spacon
  - But only a few BRAT combinations are offered by the tool.

Questions ?



XMM-Newton slew tracks

Image courtesy of XMM-Newton/A. Read/R. Saxton

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