

EPIC operations status 2018

Pedro Calderón Riaño
ESAC
15/03/2018

Issue/Revision: 1.0

Reference:

Status: For Information Only

ESA UNCLASSIFIED - For Official Use



xmm-newton

European Space Agency

➤ 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).

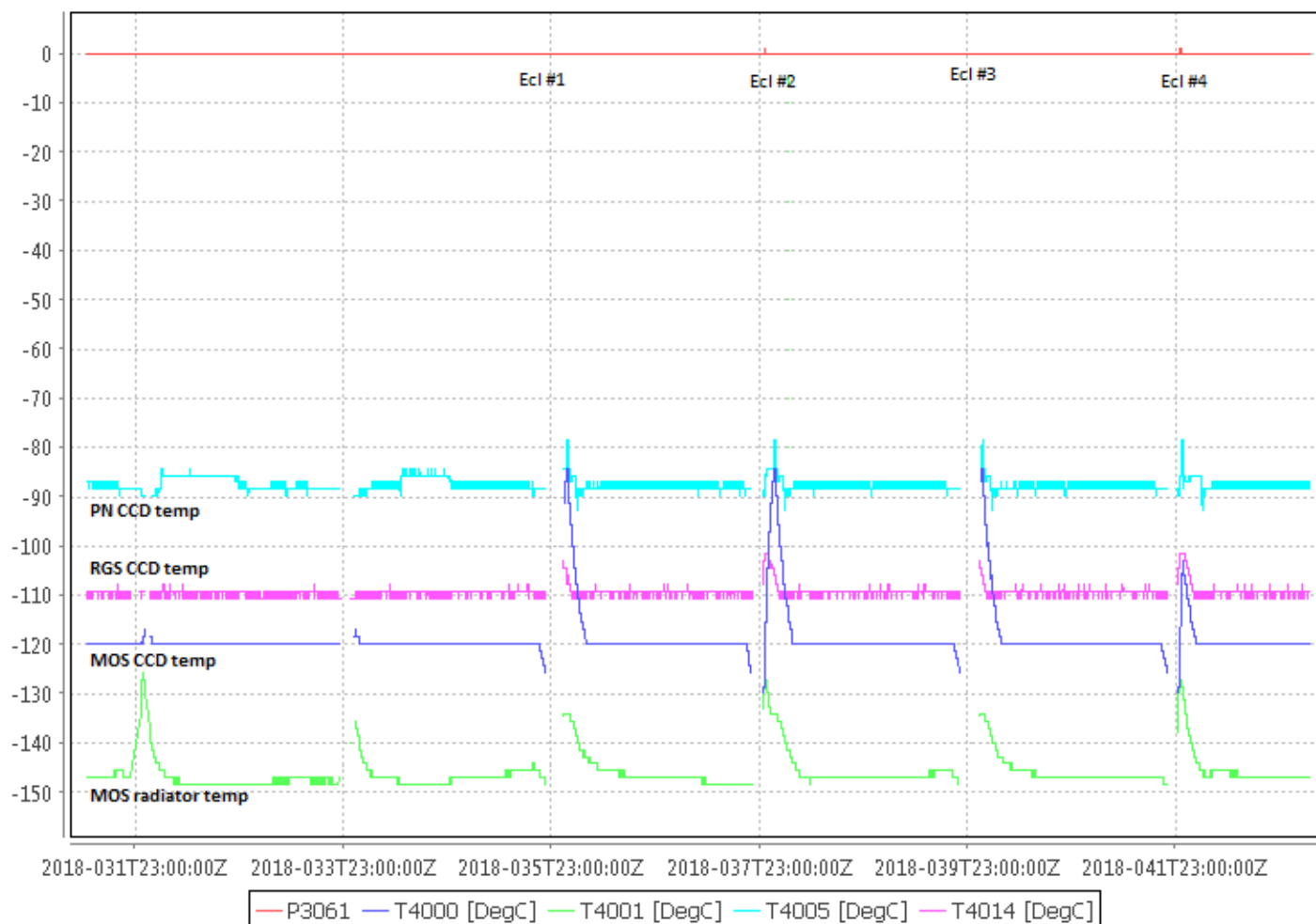


- A lot of eclipses (51)
 - The evolution of the orbit cause that now we have a lot of eclipses of relative short duration (~45 minutes as maximum).
 - But the evolution of the operations (ground stations, PSF stop too near...) cause that the instruments are powered OFF for a longer period (2 hours is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

Winter 2018 ECL temps



❖ 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



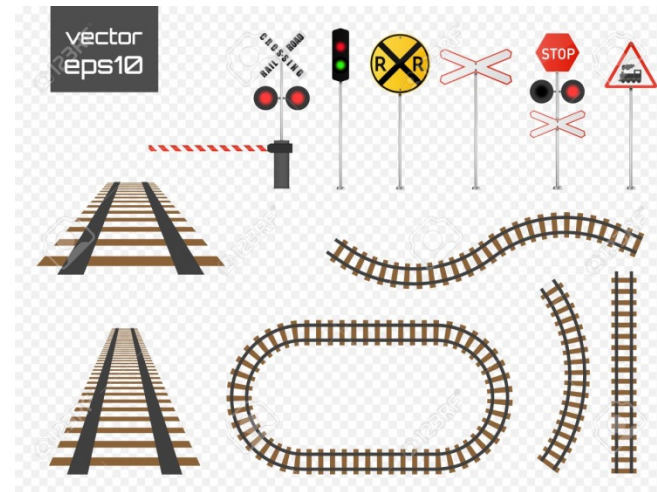
- XMM-Newton operations are being modified.
- Now we are going to have 1 space craft controller (24/7) for 3 space crafts (XMM, Integral & Gaia).
 - But they are trained only on platform, no on instruments.
 - They only may put the instruments on SAFE, if required.
 - And Gaia operations have priority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



- 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.

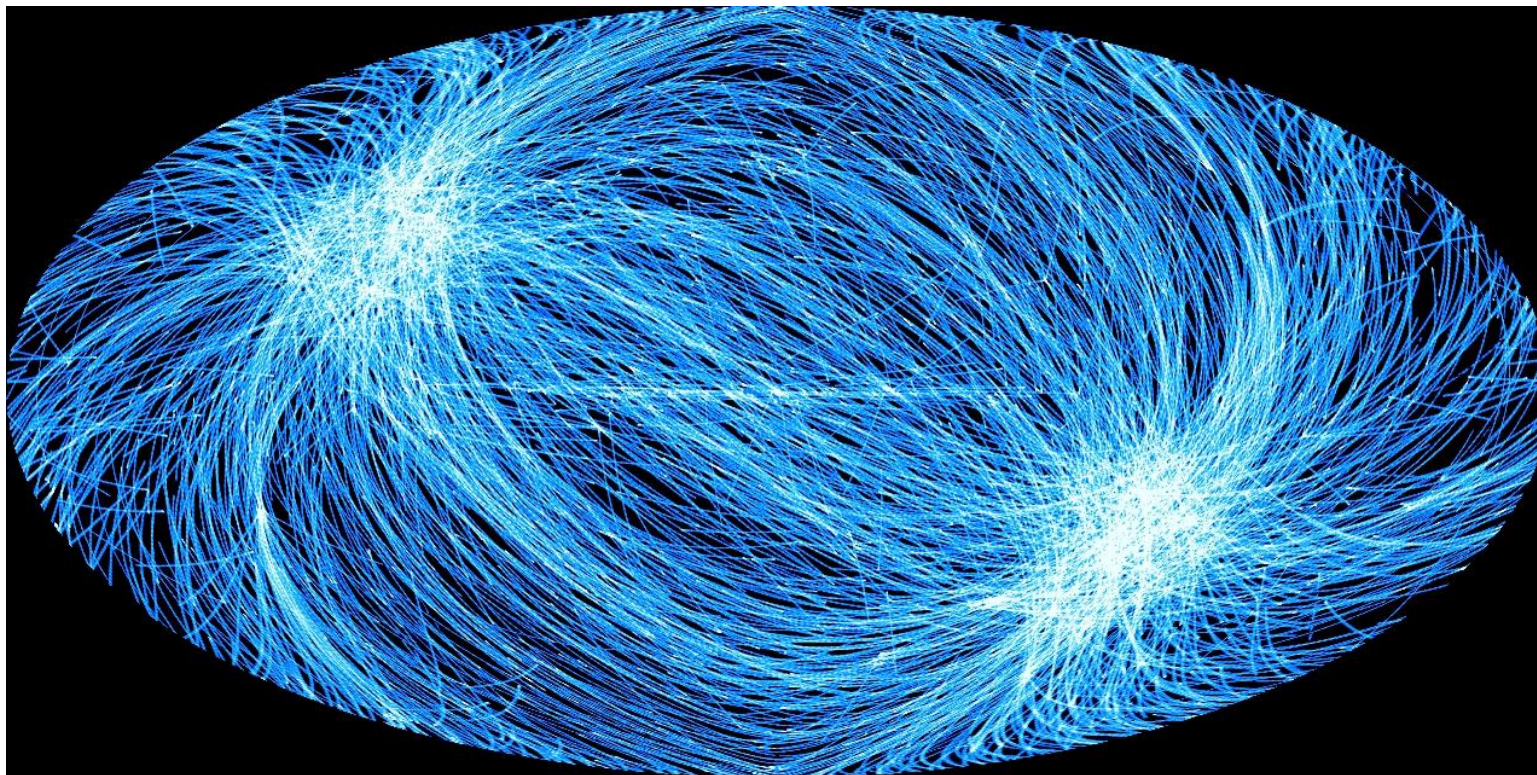
- 2. Deactivation (and Activ.) cover more possible starting cases
 - Redundant re-configuration (to be sure).



- 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

European Space Agency 