7th CAS/ESA/MPE/CNES workshop - Summary

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Mission and Spacecraft

Commissioning results reviewed.

Excellent performance of the SC subsystems

AOCS exceeds specifications: APE (absolute pointing error) < 10 “, AKE (absolute pointing knowledge) < 1”

Thermal control within specifications: Temperatures all within required range

Very good thermal stability ! Especially considering the low inclination, low altitude Earth orbit: < 0.3 K for the FXT mirrors, < 0.1 K for the FXT detectors !

Different temperature set points for the two FXT mirrors (16 degC and 23 degC) and detectors (-90 degC and -95 degC) to check if there is difference in performance

SW for autonomous onboard FXT follow-up (as a consequence of WXT observations) still to be tested (by end May). It will significantly improve mission response.

Payload

Calibration completed for 10 WXTs out of 12

Calibration to be performed soon for the 2 FXTs

WXT detected more than 2000 sources already, showing that the choice of a large FoV was good.

Mirror Flight performance almost the same as ground tested (e.g. HPD of FXT) showing excellent control of contamination during ground operations and at launch

Refrigerator of FXT working nominally and no impact of vibrations on performance

No radiation effect noticeable on the WXT detectors

New Technologies

Einstein Probe is a mission with a high content of new technologies:

CMOS detectors for WXT (and large production: 48 flight units)

MPO optics for WXT (and large production and testing: 12 units X 4 quadrants X 9 optics)

FXT detectors electronics

FXT refrigerator

They are all working fine and in spec.

Ground Segment

Ground Segment of EP is complex with many centres and interfaces: Mission Control, EP science Centre, Data Centre, ESA Ground Stations, CNES VHF network.

Significant SW development in EPSC for source identification: working well

ESA GS now fully operational and providing 6 passes/day. Trying to reduce latency time for data to Mission Control to <10 min from all ESA stations.

Science

Pipeline fully tested and operational

PV observations complete

Cycle-1 observations largely oversubscribed !

WXT already providing a wealth of data: >2000 sources identified, 17 transients from previously unknown sources detected

Non-automatic FXT follow-up performed successfully

FXT imaging of selected sources performed. High quality of the results

X-ray Counterpart of Gravitational Wave event may be detected soon

Summary

Einstein Probe working very well

Already producing science data (and papers) before end of commissioning

End-to-end observations and data processing fully tested

Very promising start