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Expected performances of X and Gamma rays detectors being operated on the Moon and in the Earth Stratosphere developed within the NRRP EMM project

Thursday 15 May 2025 12:10 (25 minutes)

As part of the "Earth Moon Mars (EMM)"project, led by INAF (Instituto Nazionale di Astrofisica) in partnership with ASI (Agenzia Spaziale Italiana) and CNR (Consiglio Nazionale delle Ricerche) and funded under the National Recovery and Resilience Plan (NRRP), we are developing the Solar X Ray Moonitor (SXRM), a Moon-based instrument to monitor solar activity from the lunar surface in the energy range of 1 to 30 keV. SXRM has two main objectives: to provide alerts in case of solar storms (flares, CME) directed at the Moon –an essential feature for future permanent missions - and to deliver diagnostics about the parent events. The final delivery of the instrument is currently expected by end of 2025 at a Technology Readiness Level (TRL) of 4. We have drafted the SXRM engineering and development plan aiming at realizing a space-qualified instrument, starting form a design that incorporates extended-performance components and following a qualification test roadmap aimed at increasing the final TRL to 6. To this end, for the purpose of electronics qualification, a stratospheric balloon flight has been planned for late summer 2025. Due to the physical processes occurring in the upper layers of the atmosphere, we have decided to use a detector with sensitivity extended up to 1 MeV for the stratospheric experiment. This presentation will focus on detector simulations, radiometric computations and the identification of the critical parameters requiring the on-ground calibration and periodical in-flight calibration.

Eligibility for "Best presentation for young researcher" or "Best poster for young researcher" prize

No

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