

Status of the LISA Radiation Monitor

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Cosmic rays and solar energetic particles will be the main components of the background radiation affecting LISA. Monitoring their fluxes will be essential for understanding the charging background of the mission and to provide vetoes for fake gravitational-wave triggers. We designed a new radiation monitor, tailored to monitor the charging of the LISA Test Masses (TMs). It consists of a telescopic arrangement of absorbers and plastic scintillators coupled to silicon photomultipliers (SiPMs). The SiPM signals are processed and digitized with the BETA ASIC, which was specifically designed for SiPM readout in space applications. The monitor will output proton detection rates in a set of integral energy channels with thresholds ranging from ~ 70 MeV to ~ 1 GeV. It will be able to observe SEP events and short-term variations of the cosmic-ray proton and helium flux at ~ 1 AU from the Sun, in an energy band that is inaccessible for most radiation monitors. We describe the main characteristics of the radiation monitor and discuss the preliminary evaluation of its performance, resulting from dedicated test beams and Monte Carlo simulations.

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