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THE SPACE RADIATION MONITORING & PROTECTION SYSTEM RADPROT

Abstract

REMRED Ltd., a space industry spin-off company of the Centre for Energy Research in Budapest, Hungary has a broad portfolio with significant heritage, amongst others, in space safety and space dosimeter systems. The company offers several products in that field; RADPROT is the one offered for spacecraft and spacecraft constellation providers to facilitate protection of the spacecraft from space weather effects. The capabilities of the system include space radiation monitoring outside and dosimetry monitoring inside the spacecraft at different locations with different shielding geometry. The data products provided by RADPROT are integral proton and electron flux/fluence for outside radiation monitoring, and total ionizing dose/dose rate (TID) and linear energy transfer (LET-)spectra in silicon for inside dosimetry monitoring. Potential use cases for the former are support for solar cell degradation analysis and provision of real-time solar particle event (SPE) system warning, for the later those are the support for COTS EEE radiation hardness assurance and real-time SPE system warnings at critical locations inside the spacecraft. RADPROT has a versatile and configurable modular design to be easily applicable for different spacecraft platforms. The space radiation monitors, the TID and the LET monitors are all flight proven elements with TRL9, whereas the central electronics unit can be developed according to customer needs. Present paper provides a system level overview of the RADPROT system.