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【305】Radiation hardness and annealing, strategies for space application of silicon photomultiplier technologies on a quasi-polar LEO orbit

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While silicon photomultipliers (SiPMs) offer advantages over traditional photomultipliers, their adoption into space missions undergo challenges due to induced degradation by cosmic radiation. The University of Geneva, GSSI and FBK Research Foundation collaborate to define SiPMs for Terzina Cherenkov telescope by studying radiation hardness and light noise in situ. Using 50MeV proton-beam and beta-radioactive source, we estimate radiation damage on SiPMs and compare results with simulated ionizing and non-ionizing effects via SPENVIS-Geant4. We developed an annealing approach suitable for a space-based middle-size satellite to limit effect of radiation damage while efficiently lowering SiPM's energy detection threshold. We will describe the mission and focus on this aspects critical for its success.

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