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# Radiation testing and space qualification of GAGG:Ce scintillator crystals for the HERMES project

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We discuss the experimental procedure and the results of an irradiation campaign on GAGG:Ce (Cerium-doped Gadolinium Aluminium Gallium Garnet) scintillator crystals, carried out in the framework of the HERMES-TP/SP (High Energy Rapid Modular Ensemble of Satellites – Technological and Scientific Pathfinder) mission at the Trento Proton Therapy Centre (TPTC) during January 2019. Samples from different manufacturers were irradiated with 70 MeV protons, at doses equivalent to those expected over orbital periods representative of satellite lifetimes.

We report our findings on the degradation of light-output and on the modifications to the afterglow emission signature following proton irradiation. We briefly discuss a new model for GAGG:Ce afterglow emission resulting from relatively low-dose proton irradiations, such as those expected from repeated passages above trapped particle regions in low Earth orbit.

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