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The GeMSE Gamma Spectroscopy Facility for Meteorite and Material Screening

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The GeMSE (Germanium Material and meteorite Screening Experiment) facility operates a low-background HPGe crystal in an underground laboratory in Switzerland, with a moderate rock overburden of 620 m.w.e.. It is devoted to material screening for rare event search experiments in astroparticle physics as well as characterization of meteorites. A multi-layer passive shielding, a muon veto and a boil-off nitrogen purge line inside the measurement cavity minimize the instrument's background rate which decreased by 33% to (164 ± 2) counts/day (100–2700 keV) after five-years of underground operation. A fit to the known background components shows that the GeMSE background is now muon-dominated.

This talk focuses on the upgraded remote operation of the experiment, its background and active mass characterization, and improvements to optimize the efficiency calculation for complex-shaped samples by means of 3d scanning.

Primary authors: LINDEMANN, Sebastian (University of Freiburg); TOSCHI, Francesco (Freiburg Universität); BAUR, Daniel (University of Freiburg); RAMIREZ, Diego (University of Zuerich); SCHUMANN, Marc (University of Freiburg)

Presenter: LINDEMANN, Sebastian (University of Freiburg)

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