

Characterization of Lutetium-based cryogenic scintillating calorimeters.

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Lutetium (Lu) based scintillators (LYSO, LuAG etc..) are widely used in applications in particle, nuclear and astrophysics. These scintillators have an intrinsic background due to the presence of the long-lived isotope Lu-176. The half-life of the electron capture decay of Lu-176 has not yet been measured and represents a very rare, highly-forbidden decay channel. As precision and novel measurements of nuclear physics parameters become more important for fields such as geochronology, new detection techniques become required. This talk will detail the development of a Lu-based scintillating cryogenic calorimeter, as part of the RAMPS experiment (RadioActive isotope Measurement Program at SNOLAB). The talk will show the evaluation of the scintillation light-yield as a function of temperature (down to 4K) and present the first data of an operating LYSO cryogenic calorimeter. Additionally, the talk will include updates on the status of upcoming efforts and present an experimental pathway towards realizing the first measurement of the electron capture decay in Lu-176.