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LUCIFER: scintillating bolometers for neutrinoless double-beta decay searches

LUCA PATTAVINA, INFN-Laboratori Nazionali del Gran Sasso

In the field of fundamental particle physics, the nature of the neutrino, if it is a Dirac or a Majorana particle, plays a crucial role not only in neutrino physics, but also in the overall framework of fundamental particle interactions and in cosmology. Neutrinoless double-beta decay (0vDBD) is the key tool for the investigation of this nature. Experimental techniques based on the calorimetric approach with cryogenic particle detectors have demonstrated suitability for the investigation of rare nuclear processes, profiting from excellent energy resolution and scalability to large masses. Unfortunately, the most relevant issue is related to background suppression. In fact, bolometers being fully-active detectors struggle to reach extremely low background level. The LUCIFER project aims to deploy the first array of enriched scintillating bolometers. Thanks to the double read-out - heat and scintillation light produced by scintillating bolometers - a highly efficient background identification and rejection is guaranteed, leading to a background-free experiment. We show the potential of such technology in ZnMoO4 and ZnSe prototypes. We describe the current status of the project, including results of the recent R&D activity.