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Current status and perspectives of the LUCIFER experiment

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The quest for Neutrinoless Double Beta Decay ($0\nu\text{DBD}$) represents one of the most promising ways to investigate the neutrino mass nature, Dirac or Majorana. A convincing detection claim demands for detectors with excellent energy resolution and almost zero background in the energy region of interest.

These features can be obtained with the approach of the LUCIFER project, funded by an European grant, which is based on the double read-out of the heat and scintillation light produced by ZnSe scintillating bolometers. The resulting identification and rejection of the α interactions, as well as the large Q-value of the emitter, will guarantee a background lower than 10^{-3} counts/keV/kg/y in the energy region of the $0\nu\text{DBD}$ of ^{82}Se , an order of magnitude lower with respect to the present generation experiments.

Despite the small mass of ~ 17 kg, LUCIFER will reach a 90% CL sensitivity of 0.6×10^{26} y on the half-life of the decay.

We describe the current status of the project, including results of the recent R&D activity.

Summary

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