



Poster session 1 - Monday 4 July

P1.062 The LUCIFER/CUPID-0 demonstrator: searching for the neutrinoless double-beta decay with Zn^{82}Se scintillating bolometers

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For future bolometric experiments on the neutrinoless double beta decay with the goal to entirely explore the inverted hierarchy region of the neutrino mass three requirements are of pivotal importance: clear reduction of present background in the energy region of interest in direction of a zero-background framework, increase in active isotope mass by applying enriched crystals only, while maintaining excellent energy resolution in the region of interest, an intrinsic feature of the bolometric technique.

These challenges are planned to be met within CUPID (CUORE Upgrade with Particle Identification), a project which at the moment is following different lines of research and development in order to identify the most promising approach for a tonne-scale future bolometric experiment, planned to be hosted in the CUORE infrastructure.

LUCIFER/CUPID-0, the first demonstrator within the frame of CUPID, aims at running the first array of enriched scintillating bolometers based on Zn^{82}Se crystals which, thanks to the phonon-light technique, allow for an α -particle identification and rejection. With a total of 30 enriched Zn^{82}Se crystals (equivalent of 7 kg of ^{82}Se) and an expected background level of 10^{-3} counts/(keV kg y) in the energy region of interest, CUPID-0 will reach a sensitivity which is comparable to existing experiments. A recent first test of three of the 30 enriched Zn^{82}Se crystals in the Hall C underground facility of the Laboratori Nazionali del Gran Sasso did prove that the performance of such scintillating bolometers is excellent in sense of energy resolution and particle identification.

We report on the progress and current status of construction of the CUPID-0 detector array which is expected to start data taking in summer 2016 and the potential of this detection technique for a future tonne-scale bolometric experiment after CUORE.