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Double Beta Decay Topology with NEMO-3 and SuperNEMO

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Neutrinoless double beta decay ($0\nu\beta\beta$) is the only practical way to understand the neutrino nature (Dirac or Majorana particle) and to observe full lepton number violation required by most beyond the standard model theories. It may also turn out to be the only way to measure the absolute neutrino mass in the laboratory environment.

The main goal of the SuperNEMO experiment is to search for $0\nu\beta\beta$ decay. The unique features of this approach are the ability to study almost

any isotope and reconstruction of the full topology of both signal (bb) events and background processes. The latter allows unprecedentedly low backgrounds to be reached and, in the event of a discovery, to produce a “smoking gun” evidence for the process. It may also allow the underlying physics mechanism to be disentangled.

Latest results obtained with NEMO-3, the SuperNEMO predecessor, will be presented including non- $0\nu\beta\beta$ results. The physics reach of the SuperNEMO project will be discussed and the status of the commissioning and physics running of its first module, the Demonstrator, will be presented.

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