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The isotopic double-beta decay source for SuperNEMO

SuperNEMO exploits the tracking-calorimetry technique pioneered by NEMO3. The key feature of SuperNEMO is its unique capability to fully reconstruct the kinematic of the event. This allows to reduce the backgrounds and to discriminate among different mechanisms behind the possible double beta decays. SuperNEMO will be able to measure different isotopes at the same time. ^{48}Ca , ^{82}Se and ^{150}Nd are currently under consideration. In the demonstrator phase, the source of double-beta decay is made of enriched ^{82}Se powder shaped in thin foils to minimise the energy loss of the out-coming particles and placed in the middle of the detector. To eliminate background events due to impurities in the source foil, the required radio-purity level for ^{208}Tl and ^{214}Bi are $2\ \mu\text{Bq/kg}$ and $10\ \mu\text{Bq/kg}$ respectively. The NEMO collaboration is conducting an R&D activity to strike the best materials and the optimal design of the source foil. Radio-purity measurements of each material under consideration for the foil production are ongoing using HPGe and BiPo detectors. This poster describes in detail the foil production procedure and the different designs currently under consideration. Preliminary results of the radio-purity measurements of different candidate materials for the foil construction will be presented.

Primary author: Dr REMOTO, Alberto (Laboratoire d'Annecy-le-Vieux de Physique des Particules (LAPP))

Presenter: Dr REMOTO, Alberto (Laboratoire d'Annecy-le-Vieux de Physique des Particules (LAPP))

Track Classification: Neutrinoless Double Beta Decay