

The SuperNEMO Demonstrator double beta experiment

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The SuperNEMO experiment will study decays of ^{82}Se in order to look for neutrinoless double beta decays ($0\nu\beta\beta$), interactions that, if observed, would prove the Majorana nature of neutrinos. SuperNEMO inherits the tracking-calorimetry technology of NEMO-3, which allows for a clear determination of event kinematics, while aiming for an improved background suppression and $0\nu\beta\beta$ sensitivity. A demonstrator module will start operating in 2019. The double beta emitting source, 7 kg of ^{82}Se , is shaped in thin foils (20 squared meters), and surrounded by a half meter long helium tracking chamber composed of 2000 Geiger cells. A 4 PI gamma catcher and electron calorimeter, made of plastic scintillators with an energy resolution of 7% (FWHM) at 1 MeV, surrounds the whole. The demonstrator is constructed in ultra low radioactivity materials and is installed in the Modane Underground Laboratory in the Frejus Tunnel under the French-Italian Alps.

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