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The SuperNEMO Demonstrator: a unique technology for high-precision measurements of ββ-decay modes

martedì 18 giugno 2024 17:30 (2 ore)

SuperNEMO is searching for the hypothesised lepton-number-violating neutrinoless double-beta decay (0νββ) process. Our unique NEMO-3-style tracker-calorimeter detector tracks individual particle trajectories and energies. This enables powerful background rejection and detailed studies of Standard Model (2νββ) decay. By studying electron and photon energies and relative trajectories, SuperNEMO will investigate nuclear processes hidden to other technologies, such as decays to excited nuclear states, and will constrain the axial coupling constant, gA. By precisely measuring 2νββ observables we will seek beyond-the-Standard-Model effects like exotic 0νββ modes, Lorentz-violating decays and bosonic neutrino processes.
The SuperNEMO Demonstrator at LSM, France has a 6.1kg Se-82 ββ source, and is taking background data vital to isolate future signals. It is calibrated with a Bi-207 source deployment system. Shielding, composed of layers protecting detector against external photons and neutrons, is now in construction. The ultimate goal of SuperNEMO is to perform a background-free measurement in ROI of 0νββ for Se-82. The ββ data-taking is expected to start in 2024.

Poster prize

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