

Calibration status of the SuperNEMO calorimeter

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The SuperNEMO experiment aims at testing the Majorana nature of neutrinos, looking for the neutrinoless double beta decay. The final detector goal is to reach a sensitivity of 10^{26} years on the $0\nu\beta\beta$ decay half-life, i.e a Majorana neutrino mass of 50-100 meV. The first module of the SuperNEMO experiment is under construction at Laboratoire Souterrain de Modane (LSM), with 6.23 kg of ^{82}Se . Electrons from disintegration are tracked when crossing the wire chamber, then their energies are measured by calorimetry. The calorimeter is composed of 712 optical modules, an assembly of large volume plastic scintillators, mainly coupled with 8 inch photomultipliers. It achieved a resolution of 8% FWHM in energy, and 400 ps in time at 1 MeV. The commissioning of the SuperNEMO calorimeter has begun in 2019. As photomultiplier signals are sampled by electronic boards, waveform parameter optimisations were implemented. The calorimeter response has been calibrated in energy using the internal ^{208}Tl spectrum, and photomultipliers gain were equalised at 1 MeV. A Cobalt 60 source, emitting two gammas in coincidence, was used to determine the time resolution of all optical modules. The calorimeter performances of the first SuperNEMO module are presented.

Cloé Girard-Carillo, Hichem Tedjiti, Axel Pin, Malak Hoballah, Laurent Simard, Mathieu Bongrand, Christine Marquet, Yves Lemièrre, Emmanuel Chauveau, José Busto

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Authors: Mr TEDJDITI, Hichem; Mrs GIRARD-CARILLO, Cloé; Mr PIN, Axel

Presenter: HOBALLAH, Malak

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