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Calibration status of the SuperNEMO calorimeter

The SuperNEMO experiment aims to test the Majorana nature of neutrinos, looking for the neutrinoless double beta decay.

The final detector's goal is to reach a sensitivity of 10^{26} years on the $^{82}\text{Se } 0\nu\beta\beta$ decay half-life.

The SuperNEMO demonstrator is under construction with 6.23 kg of ^{82}Se .

Decay electrons are tracked in a wire chamber, and their energies measured calorimetrically.

The calorimeter is composed of 712 optical modules: plastic scintillators, mainly coupled with 8'' photomultipliers.

It achieves 8% FWHM energy and 400 ps time resolution, at 1 MeV.

Calorimeter commissioning began in 2019.

The calorimeter's energy response was calibrated using the internal ^{208}Tl spectrum, and photomultipliers' gains were equalised at 1 MeV.

A Cobalt-60 source, emitting two coincident gammas, was used to determine time resolution.

The demonstrator's calorimeter performance is presented.

Mini-abstract

Calorimeter commissioning data confirms SuperNEMO double-beta detector meets performance goals.

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