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The HOLMES experiment

The European Research Council has recently funded HOLMES, a new experiment to directly measure the neutrino mass. HOLMES will perform a calorimetric measurement of the energy released in the decay of ^{163}Ho . The calorimetric measurement eliminates systematic uncertainties arising from the use of external beta sources, as in experiments with beta spectrometers. This measurement was proposed in 1982 by A. De Rujula and M. Lusignoli, but only recently the detector technological progress allowed to design a sensitive experiment. HOLMES will deploy a large array of low temperature microcalorimeters with implanted ^{163}Ho nuclei. The resulting mass sensitivity will be as low as 0.4eV. HOLMES will be an important step forward in the direct neutrino mass measurement with a calorimetric approach as an alternative to spectrometry. It will also establish the potential of this approach to extend the sensitivity down to 0.1eV. We outline here the project with its technical challenges and perspectives.

Primary author: Dr NUCCIOTTI, Angelo (Dipartimento di Fisica dell'Università di Milano-Bicocca / INFN Sezione di Milano-Bicocca)

Presenter: Dr NUCCIOTTI, Angelo (Dipartimento di Fisica dell'Università di Milano-Bicocca / INFN Sezione di Milano-Bicocca)

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