



## Poster session 4 - Friday 8 July

### P4.038 The electron capture in Ho-163 experiment ECHO: towards sub-eV sensitivity on the electron neutrino mass

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*on behalf of ECHO Collaboration*

The Electron Capture in Ho-163 – ECHO - experiment is designed to investigate the electron neutrino mass with sub-eV sensitivity by the analysis of the endpoint region of the calorimetrically measured Ho-163 spectrum. Recently the energy available for the decay  $Q_{EC} = 2833(30\text{stat})(15\text{sys})$  eV has been precisely determined by the ECHO collaboration.

In the present phase, ECHO-1k, about 1KBq of high purity Ho-163 source will be embedded in multiplexed arrays of low temperature metallic magnetic calorimeters operated in a low background cryogenic platform at about 20 mK. The aim of this phase is to achieve a sensitivity on the electron neutrino mass below  $10 \text{ eV}/c^2$  and a precise characterization of the parameters describing the spectrum. At the same time, the detector technology, the production and purification of large Ho-163 sources as well as the identification and reduction of background will be optimized to be used in the second phase of the experiment, ECHO-1M where a Ho-163 source of the order of MBq will be used. The statistics acquired in about one year will allow for investigating the electron neutrino mass in the sub- eV range.

The availability of such a high resolution spectrum, which could extend to very low energy, will allow not only for the investigation of the existence of eV scale sterile neutrinos, but also of keV-scale sterile neutrinos up to a mass of about  $Q_{EC}$ .

In this contribution, the detailed plans for ECHO-1k and ECHO-1M are presented. The sensitivity to determine the electron neutrino mass for different experimental scenarios and the possibility to find evidence of heavy neutrino mass states related to sterile neutrinos are discussed.