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## The Electron Capture in <sup>163</sup>Ho Experiment

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The Electron Capture in <sup>163</sup>Ho (**ECHo**) experiment is designed to investigate the electron neutrino mass  $m_{\nu_e}$  with sub-eV sensitivity by the analysis of the electron capture (**EC**) energy spectrum of <sup>163</sup>Ho.

The sensitivity on the electron neutrino mass is crucially related to the energy available for the decay  $Q_{EC} = 2833(30\text{stat})(15\text{sys}) eV$ , which has been precisely determined by the ECHo collaboration.

Accordingly, a sensitivity below 10 eV is expected to be attained at the end of the present phase of the experiment, ECHo-1k.

In this phase, about 1 kBq of high purity <sup>163</sup>Ho is going to be implanted in multiplexed arrays of low temperature metallic magnetic calorimeters which are operated in a reduced background environment.

The goals of ECHo-1k are the precise characterization of the parameters describing the spectrum, optimizing the implantation process of <sup>163</sup>Ho into the detector arrays, optimization of detector production and identification and reduction of the background in the experimental setup.

The results will pave the way to a future phase of the experiment, where activities of the order of MBq <sup>163</sup>Ho will be used.

This second phase aims to approach sub-eV sensitivity on the electron neutrino mass.

Furthermore, the high statistics and high resolution measurement of the  $^{163}$ Ho electron capture spectrum will allow the investigation of the existence of eV and keV-scale sterile neutrinos.

In this contribution, a general overview of the ECHo experiment is presented and the current status as well as the future perspectives are discussed.

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