

The ECHO neutrino mass experiment

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The Electron-Capture- ^{163}Ho experiment, ECHO, aims to investigate the electron neutrino mass in the sub-eV range by means of the analysis of the calorimetrically measured electron capture spectrum of ^{163}Ho . Arrays of low temperature metallic magnetic calorimeters having the ^{163}Ho source embedded in the absorber will be used. A precise description of the expected spectrum will be achieved by theoretical calculations in parallel with dedicated experimental investigations. Independent measurements of the Q_{EC} -value will be performed using high precision Penning traps. For the Q_{EC} measurements as well as for the calorimetric measurement of the ^{163}Ho spectrum, high purity ^{163}Ho sources will be produced. Detailed studies of the background and of methods to reduce it will be performed.

After the successful results achieved by measuring two single pixels with implanted ^{163}Ho , a pilot experiment consisting of about 100 detectors grouped in arrays, which are read out with the microwave multiplexing technique, is under preparation. This medium scale experiment will be able to reach a neutrino mass sensitivity in the few eV range.