



Contribution ID: 21

Type: **Invited Talk**

The Electron Capture in ^{163}Ho experiment, ECHo

Tuesday, 25 February 2020 10:00 (30 minutes)

The goal of the Electron Capture in ^{163}Ho (ECHo) experiment is the determination of the electron neutrino mass by the analysis of the electron capture spectrum of ^{163}Ho . The detector technology is based on metallic magnetic calorimeters operated at a temperature of about 10 mK in a reduced background environment. For the first phase of the experiment, ECHo-1k, the detector production has been optimized and the implantation process of high purity ^{163}Ho source in large detector arrays has been refined. The implanted detectors have been successfully operated and characterized at low temperatures, reaching an energy resolution below 5 eV. High statistics and high resolution ^{163}Ho spectra have been acquired and analyzed in the light of the recent advanced theoretical description of the spectral shape, considering the independently determined and more precise value of the energy available to the electron capture process, Q_{EC} . We present preliminary results obtained in ECHo-1k so far and discuss the necessary upgrades towards the second phase of the experiment, ECHo-100k.

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Session Classification: Invited Talks