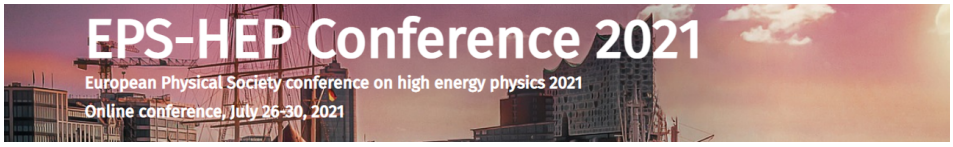

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The Electron Capture in ^{163}Ho experiment - ECHo

The Electron Capture in ^{163}Ho experiment, ECHo, is a running experiment for the determination of the neutrino mass scale via the analysis of the end point region of the ^{163}Ho electron capture spectrum. In the first phase, ECHo-1k, about 60 MMCs pixels enclosing ^{163}Ho ions for an activity of about 1Bq per pixel have been operated for several months. The goal of this first phase is to reach a sensitivity on the effective electron neutrino mass below 20 eV/c^2 by the analysis of a ^{163}Ho spectrum with more than 10^8 events. We discuss the characterization of the single pixel performance and the stability over the measuring period. Results from the analysis of the acquired data will be presented with focus on data reduction efficiency and on the procedures to obtain the final high statistics spectrum. A preliminary analysis of the ^{163}Ho spectral shape will be described and the expected sensitivity on the effective electron neutrino mass, on the basis of the properties of the presented spectrum, will be discussed. In conclusion, we will present how the performance obtained by the MMC arrays used during the first phase of the ECHo experiment have led to the design of the MMC arrays for the second phase, ECHo-100K. In ECHo-100k about 12000 MMC pixels each hosting ^{163}Ho for an activity of 10 Bq will be simultaneously operated thanks to the microwave SQUID multiplexing readout. Operating these arrays for three years will allow for reaching a sensitivity on the electron neutrino mass at the 1 eV/c^2 level.

Collaboration / Activity

ECHo Collaboration

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