

XX International Workshop on Neutrino Telescopes



Contribution ID: 64

Type: **Contributed Parallel Talk**

HOLMES , an experiment for measuring the neutrino mass

Wednesday, October 25, 2023 3:10 PM (20 minutes)

Measuring neutrino mass is challenging in nowadays particle physics and astrophysics. Direct measurements using electron kinematics in beta decays are the only theory-independent method. A possible approach for directly measuring the neutrino mass is the calorimetric one. Calorimeters measure the energy released by decays, except the neutrino fraction. However, they face limitations in balancing statistical sensitivity and background. Given the small fraction of events falling in the region of interest, to achieve a high experimental sensitivity on the neutrino mass it is important to have a high activity combined with a very small undetected pile-up contribution. HOLMES is an experiment aiming to measure neutrino mass with 1 eV sensitivity using electron capture of ^{163}Ho . To achieve its targets, HOLMES employs 1000 TESs with custom ion implantation and microwave multiplexing for readout. HOLMES has optimized its detectors and multiplexing, and the ion implanter is ready for low-dose implantation. This progress allows increasing the activity in the detectors and studying the heat capacity due to ^{163}Ho concentration. This contribution presents HOLMES' status, including initial results from implanted detectors and the experiment's overall outlook.

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Session Classification: Neutrino Properties

Track Classification: Neutrino Properties