



Contribution ID: 256

Type: Parallel Flash talk

The search for $0\nu EC\beta^+$ of ^{120}Te with CUORE

Tuesday, 23 February 2021 11:50 (5 minutes)

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CUORE (Cryogenic Underground Observatory for Rare Events) is a ton-scale experiment located at the LNGS searching for neutrinoless double beta decay of ^{130}Te . The detector consists of TeO_2 crystals operated as cryogenic calorimeters. The use of tellurium with natural isotopic composition allows us to search for the decay of other isotopes. The neutrinoless positron emitting electron capture of ^{120}Te (natural abundance 0.09(1)%) has a clear signature from the 511-keV annihilation γ rays. We present an analysis of this process based on a new algorithm to perform the simultaneous spectral fit over five selected decay scenarios. Each scenario is characterized by a set of crystals simultaneously interested by a detectable energy release. We describe the blinded analysis we performed to model multi-site background structures and study the systematics.

Collaboration name

CUORE

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Session Classification: Double Beta decays and Neutrino Masses

Track Classification: Neutrino Masses and Mixings