Contribution ID: **295** Type: **Parallel talk**

First results from the CUORE background model

Tuesday 29 August 2023 16:45 (15 minutes)

The Cryogenic Underground Observatory for Rare Events (CUORE) is a tonne scale detector searching for neutrinoless double beta decay ($0\nu\beta\beta$) in ^{130}Te. The CUORE detector is made of 988 TeO_2 crystals operated at around 15 mK in the Gran Sasso National Laboratories (Italy).
Being the $0\nu\beta\beta$ a very rare process, every single background component has to be precisely understood. Material screenings and assays, together with a detailed set of Monte Carlo simulations, accomplish this essential and complex task, modeling the experimental background. This is essential to better understand the data of CUORE and to deepen the knowledge about the cryogenic setup, which is planned to be used also for the next generation experiment: CUPID.
The CUORE background model reconstructs the data by means of a Bayesian fitting algorithm.
We will present the new results of this analysis showing an estimation of all the contamination activities of crystals and surrounding materials. In particular, a dedicated delayed coincidence analysis allows to better determine surface α contaminations which represent the most prominent background in the $0\nu\beta\beta$ region of interest.
We will also present the updated measurement of the $2\nu\beta\beta$ decay half-life of ^{130}Te.

Submitted on behalf of a Collaboration?

Yes

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Session Classification: Neutrino physics and astrophysics

Track Classification: Neutrino physics and astrophysics