ID contributo: **76** Tipo: **Poster**

Background decomposition of the CUORE experiment and measurement of the $2\nu\beta\beta$ half-life of ^{130}Te

martedì 18 giugno 2024 17:30 (2 ore)

The Cryogenic Underground Observatory for Rare Events (CUORE) is a tonne scale detector designed to search 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 Laboratory(Italy).

The unfolding of the experimental backgrounds is of primary importance in discovering a very rare process like the $0\nu\beta\beta$ decay. Material screenings and assays, together with a detailed set of Monte Carlo simulations, accomplish this complex task, modeling the CUORE data. Moreover, the characterization of the experimental setup provides an essential input for the background budget of the next-generation experiment, CUPID, which will exploit the same cryogenic facility.

We will show the reconstruction of the 1 ton·yr CUORE data by means of a simultaneous Bayesian fit of 39 different energy spectra over the entire detector energy range. The determination of the background components activities will be discussed, along with a comprehensive analysis of the fit systematics, which allows studying the space and time dependence of the contaminants.
We will also show a dedicated fit to the CUORE data for the precise determination of half-life and shape of the $2\nu\beta\beta$ decay of ^{130}Te.

Poster prize

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