



LNGS SEMINARS

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New results from the CUORE experiment

Abstract

The Cryogenic Underground Observatory for Rare Events (CUORE) is the first high-resolution, fine-grained experiment searching for neutrino-less double beta decay ($0\nu\beta\beta$) with a mass of the order of one-ton. The detector, located at the Laboratori Nazionali del Gran Sasso in Italy, consists of an array of 988 TeO_2 bolometers arranged in a compact structure of 19 towers, and operated at ~ 10 mK temperature.

The construction of the experiment was completed in August 2016 with the installation of all towers in the cryostat. Following the cool-down, and a preliminary diagnostic and optimization campaign, the first science data taking was started in spring 2017. The corresponding preliminary results on ^{130}Te $0\nu\beta\beta$ and $2\nu\beta\beta$ were released in October 2017. A considerable effort was devoted during 2018 to understand how to operate in stable and optimal conditions the complex cryogenic system of CUORE in order to guarantee a proper operation of the detector and the largest duty cycle. Science and technical runs were alternated to maintenance periods until we reached excellent operation conditions in early 2019. The operating temperature was fixed to 11 mK and the actual science data taking eventually started.

A significant increase of the exposure has been obtained since Fall 2017. The corresponding updated $0\nu\beta\beta$ results of CUORE are presented. An update of the CUORE background model is also discussed and the latest measurement of the ^{130}Te $2\nu\beta\beta$ half-life is provided. The capabilities of long-term operation and stability of the experiment and the detector performance are then reviewed.

September 5, 2019 - h 2:30 pm

LNGS - "E. Majorana" room

<http://agenda.infn.it/e/nutini>