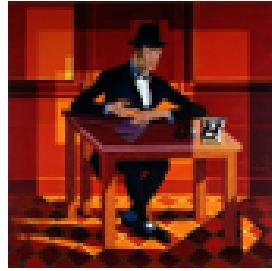


DISCRETE 2012 - Third Symposium on Prospects in the Physics of Discrete Symmetries



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Status of the CUORE experiment

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One of the fundamental open questions in elementary particle physics is the value of the neutrino mass and its nature of Dirac or Majorana particle. Neutrinoless double beta decay (DBD 0ν) is a key tool for investigating these neutrino properties and for finding answers to the open questions concerning mass hierarchy and absolute scale.

Experimental techniques based on the calorimetric approach with cryogenic particle detectors are proved to be suitable for the search of this rare decay, thanks to high energy resolution and large mass of the detectors. The CUORE (Cryogenic Underground Observatory for Rare Events) experiment will search for DBD 0ν in Te-130. The CUORE setup consists in an array of 988 tellurium dioxide crystals, operated as bolometers, with a total mass of about 230 kg of Te-130. The experiment is under construction at the Gran Sasso National Laboratory in Italy. As a first step towards CUORE, a tower prototype (CUORE-0) has been assembled and is running. In this talk a detailed description of the CUORE-0 tower, its performances and the expected sensitivity will be given. The status of the CUORE experiment, its critical points and its expected sensitivity on the base of what we will learn with CUORE-0 will then be discussed.

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