ID de Contribution: **35** Type: **Talk**

An innovative Neganov-Luke-assisted light detector for the sensitivity enhancement of CUORE experiment

mercredi 31 mai 2017 12:40 (15 minutes)

The neutrinoless double-beta decay (0ν-DBD) is a hypothetical rare nuclear transition producing only two electrons in the final state. Its discovery would have important consequences, demonstrating the Majorana nature of neutrino, allowing the measurement of its absolute mass scale and proving the non-conservation of the lepton number. Nowadays CUORE - with its 988 TeO_2-based bolometers searching for 0ν-DBD of ^{130}Te at 2527 keV - is one of the most sensitive experiment, but it is not a background free experiment because of α particles with degraded energy emitted by surface contamination. A promising solution to this problem is the detection of the around 100 eV of Cherenkov light produced by the 0ν-DBD events. We have recently proved that our Neganov-Luke-assisted light detector can measure this tiny signal thanks to the amplification of thermal signals by a superimposed electric field. We tested the performances of this device coupled to a CUORE bolometer in the Laboratoire Souterrain de Modane (FR): we obtained a signal amplification of 12.7, improving the signal to noise ratio by a factor 7.1 and reducing the baseline noise from 108 eV to 9.9 eV. The events in the β/γ region were identified with a 95% acceptance with a rejection factor of 99.95% for α particles.

Auteur principal: Mlle NOVATI, Valentina (CNRS-CSNSM)

Orateur: Mlle NOVATI, Valentina (CNRS-CSNSM)

Classification de Session: Neutrinos