Irfu
cea
saclay

SÉMINAIRE du SPP

Igor Irastorza

(Université de Saragosse)

A Neutrino Experiment with a Xenon TPC (NEXT) to look for double beta decay

Neutrinoless double beta decay is nowadays considered one of the most interesting (and searched) phenomena in neutrino physics, being the only physical process at hand that could tell us whether neutrinos are Dirac or Majorana particles. Current generation of experiments will provide results in the near future at the scale of about 100 kg of source mass, being sensitive to effective neutrino masses of the order ot 50-100 meV. In order to go down to 10 meV, and fully explore the inverse hierarchy models of neutrino masses, experiments at the few tons scale will be needed. Extrapolations of current strategies to the ton scale are either impossible (due to energy resolution) or at least very difficult, (due to the continuously rising requirements on radiopurity and shielding as we increase the target mass). A gas Xe TPC could in principle outdo current approaches by exploiting the topological signature of double beta events in the gas to further reject backgrounds. The latest advances in TPC readout technologies both in charge and light, like, for example, the latest Micromegas readout planes, allow the realization of this option while keeping the necessary good energy resolution that conventional TPCs have usually missed. This concept has been recently materialized in the NEXT proposal, aiming at the construction of a 100 kg enriched Xe gas TPC in the new Laboratorio Subterráneo de Canfranc (LSC), in a time span of 5 years, with the subsequent goal of exploring the transition to a ton scale device. The NEXT project have been presented to the LSC scientific committee, and very well received. An active R&D is already ongoing as the first steps of the project, which includes, among other issues, the measurement of ultimate energy resolution in Xenon gas. NEXT have very recently obtained substantial funding for its 5 years program from the excellence program "Consolider" of the Spanish Ministry of Science and Innovation.

Mardi 30 septembre 2008 à 11 heures

Salle André Berthelot, bât. 141

Le café sera servi 15 minutes avant

NB : *La présentation d'une carte d'identité ou d'un passeport est exigée à l'entrée du centre. Tous les auditeurs extérieurs sont priés de prévenir à l'avance de leur visite Emilie Chancrin, tél. 01 69 08 23 50 (U.E. : délai de 24 h, hors U.E. : délai de 4 jours).*