

NEXT: a gaseous-Xe TPC for the neutrinoless double-beta decay

Double beta decay (DBD) experiments are one of the most active research topics in Neutrino Physics. The measurement of the neutrinoless mode DBD could give unique information on the neutrino mass scale as well as the neutrino Majorana/Dirac nature. Current generation of experiments aim at detector target masses at the 100 kg scale, while the next generation will need to go to the few tons in order to completely explore the inverse hierarchy models of neutrino mass. Very good energy resolutions and ultra-low background levels are the two main experimental requirements for a successful experiment. NEXT (Neutrino Experiment with a Xenon TPC) is a project to look for the neutrinoless double beta decay of Xe^{136} in the Canfranc Underground Laboratory (LSC) in the Spanish Pyrenees. It has been approved by the LSC scientific committee and has been funded by the Consolider Program of the Spanish Ministry of Science to carry out the construction of 100 kg enriched high-pressure xenon gas (HPGXe) TPC. The merit of the proposal lies on the excellent energy resolution achievable by the electroluminescence signal in pure Xe, and the background rejection power provided by the topological information of the electron tracks obtained by a photosensor array (SiPMs, APDs or PMTs) or a Micromegas plane. We will report on the progress of the experiment and especially the results of the first generation of prototypes studying both the electroluminescence signal and the charge amplification signal with Micromegas in pure HPGXe.

Author: Dr DAFNI, Theopisti (Universidad de Zaragoza)

Presenter: Dr DAFNI, Theopisti (Universidad de Zaragoza)