



Contribution ID: 191

Type: **Poster session**

Status and Future of the NEXT experiment for neutrinoless double beta decay searches

NEXT (Neutrino Experiment with a Xenon TPC) is a neutrinoless double beta decay experiment located at the Laboratorio Subterráneo de Canfranc (LSC, Spain). Its aim is to demonstrate that the neutrino is a Majorana particle by detecting the neutrinoless double beta decay process in xenon gas enriched in the ^{136}Xe isotope. The detector technology used in NEXT is that of radiopure high pressure time projection chambers with electroluminescence amplification, which provide an excellent energy resolution of $\sim 1\%$ FWHM in the energy region of interest, a topological reconstruction that allows rejecting single-electron background events and a strong potential for “in situ” tagging of the barium daughter ion. The experiment has been developing in phases.

The NEXT-White detector is currently running at the LSC and contains approximately an active Xe mass of 5 kg. Its purpose is to demonstrate the excellent energy resolution, to validate the reconstruction algorithms and the background model, and to make a measurement of the two-neutrino double beta decay of ^{136}Xe .

The 100 kg NEXT-100 detector is under construction and is scheduled to be installed and assembled by the end of the 2021. The predicted 90% CL sensitivity to the neutrinoless double beta decay half-life will reach 10^{26} years for an exposure of about 400 kg-year.

A future tonne-scale detector is expected to reach in a few years of operation a sensitivity to the half-life better than 10^{27} years, improving the current limits by more than one order of magnitude.

In this talk, I will report on recent results obtained with the NEXT-White detector, on the NEXT-100 construction status and on the prospects of future NEXT detectors.

Primary author: ROMO-LUQUE, Carmen (Universidad de Valencia)

Presenter: ROMO-LUQUE, Carmen (Universidad de Valencia)

Session Classification: Neutrino Physics Session 2

Track Classification: Neutrino Physics