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Results and future plans of the NEXT double beta decay experiment

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Summary

The Neutrino Experiment with a Xenon TPC (NEXT) searches for the neutrino-less double beta decay of 136Xe using a high pressure xenon gas time projection chamber. This detector technology has several key advantages, including excellent energy resolution, powerful event classification based on track topology, and favorable mass scalability. It also offers the tantalising possibility of tagging the daughter ion produced in the decay. The current stage of the experiment, NEXT-White, has been been taking data at the Laboratorio Subterráneo de Canfranc (LSC) in Spain since late 2016.

In this talk, we will review recent results from NEXT-White after the first year of low-background operations using both xenon depleted in the 136Xe isotope as a direct measure of background, and enriched xenon data to measure the two neutrino mode. Results form dedicated calibration runs to study detector performance will also be shown. Finally, we will conclude by discussing the experiment's prospects, starting from the NEXT-100 detector to be commissioned in 2020.

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