

Search for neutrinoless double beta decay with the NEXT experiment

Friday 19 July 2024 10:45 (15 minutes)

The NEXT collaboration seeks to discover the neutrinoless double beta decay ($\beta\beta_{0\nu}$) of Xe-136 using a high-pressure gas time projection chamber with electroluminescence gain and optical read-out. An initial medium-scale prototype, NEXT-White, with 5-kg of xenon was operational at the Laboratorio Subterráneo de Canfranc (LSC) from 2016 to 2021. This prototype has proven the outstanding performance of the NEXT technology in terms of energy resolution ($<1\%$ FWHM at 2.6 MeV) and precise event topology reconstruction, crucial for distinguishing signal from background events. In this talk, I will review the performance of the NEXT-White detector and present the measurement of the half-life of the double beta decay ($\beta\beta_{2\nu}$) and the derived limits on the half-life of the $\beta\beta_{0\nu}$ decay. The results were obtained with both a background-model-dependent approach and a novel direct background-subtraction technique using a combination of 271.6 days of Xe-enriched data and 208.9 days of Xe-depleted data.

Alternate track

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