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NEXT, a neutrinoless double beta decay experiment

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The NEXT experiment searches for the neutrinoless double beta decay in Xe-136 using a series of detectors based on the high pressure xenon gas time projection chamber (HPXeTPC) technology. The previous stage of this family of detectors was NEXT-White, the first radiopure detector of the NEXT series, with 5kg of Xe. Its goals were a detailed assessment of the backgrounds for Xe-136 double beta decay searches, the measurement of the Xe-136 2νββ half-life and the characterisation of the detector performance at energies close to the Xe-136 decay energy. Since its decommissioning in 2021, NEXT has entered its current stage, with the construction of the NEXT-100 detector. NEXT-100 will hold up to 80 kg and is estimated to start running by the beginning of 2024. This detector will perform NEXT's first sensitive neutrinoless double beta decay search in Xe-136. Both NEXT-White and NEXT-100 are hosted by the Laboratorio Subterráneo de Canfranc, located in the Spanish Pyrenees. R&D has also started for next-generation NEXT detectors beyond NEXT-100, which may enable for the first time the detection of the daughter 136Ba++ ion produced in the Xe-136 decay. In this talk we will discuss the latest results of the experiment brought by NEXT-White, including NEXT's first search for the 0νββ, the status of NEXT-100 construction and R&D prospects towards future tonne scale detectors.

Collaboration / Activity

NEXT

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