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Latest results from EXO-200 and status of nEXO

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The EXO-200 and nEXO Collaborations are searching for the neutrinoless double beta (0vbb) decay of 136-Xe using time projection chambers (TPCs) filled with enriched liquid xenon.
EXO-200 has completed phase II operations in December 2018 with upgraded hardware. Highlights of EXO-200 contributions and final results will be presented.
nEXO is a tonne-scale 0vbb decay search based on the ultra-low background liquid xenon technology validated by EXO-200. With about 5000 kg of xenon enriched to 90% in the isotope 136, nEXO has a projected half-life sensitivity of approximately 10E28 years. This represents an improvement in sensitivity of about two orders of magnitude with respect to current results. Based on the experience gained from EXO-200 and the effectiveness of xenon purification techniques, we expect the background to be dominated by external sources of radiation. The sensitivity increase is, therefore, entirely derived from the increase of active mass in a monolithic and homogeneous detector, along with some technical advances perfected in the course of a dedicated R&D program. Hence the risk which is inherent to the construction of a large, ultra-low background detector is reduced, as the intrinsic radioactive contamination requirements are generally not beyond those demonstrated with the present generation 0vbb decay experiments. Indeed, most of the required materials have been already assayed or reasonable estimates of their properties are at hand. The base design of the detector configuration will be presented. This design for nEXO presents a compelling path towards a next generation search for 0vbb decay, with a substantial possibility to discover physics beyond the Standard Model.

Author: Prof. FARINE, Jacques (Laurentian University)

Presenter: Prof. FARINE, Jacques (Laurentian University)

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