

The Design and Status of nEXO: a Next-Generation Neutrinoless Double-Beta Decay Experiment

Tuesday, 9 May 2017 14:50 (15 minutes)

The determination of the Majorana nature of the neutrino is the chief goal of the proposed next generation of neutrinoless double-beta decay ($0\nu\beta\beta$) experiments. By achieving a sensitivity on the rate of $0\nu\beta\beta$ in ^{136}Xe of 1.9×10^{25} years, the predecessor to nEXO, EXO-200, has demonstrated the feasibility of using ^{136}Xe for potentially observing neutrinoless double-beta decay. Building on the proven methods of EXO-200, the nEXO collaboration plans to use 5-tonnes of liquid Xe enriched in ^{136}Xe in a single monolithic time projection chamber. The primary focus of design is to achieve a sensitivity to the $0\nu\beta\beta$ of ^{136}Xe of 1×10^{28} years within 10 years of data taking thereby allowing the experiment to probe the effective Majorana neutrino mass allowed by the inverted neutrino mass hierarchy. Initial design and current R&D efforts will be presented.

Primary author: Dr DAUGHHETEE, Jacob (University of South Dakota)

Presenter: Dr DAUGHHETEE, Jacob (University of South Dakota)

Session Classification: Neutrino Properties

Track Classification: Non-Accelerator-Based Neutrino