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Development of advanced photon-detection techniques for neutrinoless double beta decay studies with nEXO.

Monday, August 19, 2024 1:45 PM (10 minutes)

Demonstrating the Majorana nature of the neutrino by observing a neutrinoless double beta decay would be a significant progress in modern physics. It could explain the asymmetry between matter and antimatter and confirm that the neutrino is its own antiparticle. Such a rare phenomenon needs significant efforts and advanced facilities to be observed. The nEXO international collaboration is a proposed future experiment to detect this decay. It is made of a time projection chamber, filled with 5 tons of liquid 136Xe and covered by ~ 50,000 silicon photomultipliers (SiPMs) to detect the scintillation light produced by the decay. To ensure that the SiPMs will perform as required for the nEXO experiment, detailed characterization measurements are being carried out at McGill and other Canadian universities. One such measurement is a diode-by-diode scan, requiring a system that can send single photons to a 50µm target. This presentation will focus on the realization and the operation of this experimental set-up.

What area of study best describes your talk?

Physics

If you answered 'Other', please provide the study area.

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Session Classification: Presentations