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Silicon Photomultipliers for nEXO

Tuesday 9 June 2020 13:15 (15 minutes)

The nEXO experiment is being designed to search for neutrinoless double beta decays in 5 tonnes of liquid xenon enriched in Xe-136. Events in the detector will result in the observation of both charge signals and scintillation light. This light at 175 nm will be detected using UV-sensitive silicon photomultipliers (SiPM) covering an area of about 4.5 m². To achieve better than 1% energy resolution, an overall light detection efficiency higher than 3% is required, which implies an SiPM photodetector efficiency of at least 15%. A dark noise rate of less than 50 Hz/mm² and a correlated avalanche rate under 0.2 are also required. Recent results on SiPM device qualification from FBK and Hamamatsu, the development of Photon to Digital Converters (also known as 3D digital SiPM), and plans for large-scale SiPM integration will be presented.

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Session Classification: PPD-1 : Neutrinos Physics and challenges for rare-event detection

Track Classification: Particle Physics / Physique des particules (PPD)