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Contribution ID: **3362** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Spatially resolved laser scanning for the performance characterization of silicon photomultipliers

Wednesday 8 June 2022 13:15 (15 minutes)

The nEXO experiment is a planned tonne-scale search for neutrinoless double beta decay ($0\nu\beta\beta$) in ^{136}Xe. In a single-phase liquid xenon time-projection chamber, ionization electrons and scintillation light will be recorded to reconstruct, among other parameters, the deposited energy of an event. Silicon Photomultipliers (SiPMs) have been chosen by the nEXO collaboration to record the scintillation light. SiPMs will be assembled into larger modules of hundreds of cm^2 to cover a total of 4.5 m^2. Testing the large number of SiPM modules at operating temperatures of about -100℃ will require an automated approach and high throughput of SiPMs to be done in a reasonable timescale for nEXO.

A precision scanning mechanism has been developed to systematically scan a spatially resolved laser beam across the surface of a SiPM module at cryogenic temperature. This Optical Rail System (ORS) has been designed and constructed to move the laser beam in 2D in order to scan the SiPM modules and study their response. The status of the ORS and its capabilities, such as spatial resolution and beam position mapping, will be presented, and future plans will be discussed.

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