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Contribution ID: **3807** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Characterizing the Liquid Argon TPCs for the DUNE ND-LAr 2x2 demonstrator

Monday 19 June 2023 16:45 (15 minutes)

The Deep Underground Neutrino Experiment or DUNE is an ambitious accelerator based neutrino oscillation experiment that is not only able to resolve the mass hierarchy, but also has excellent potential to measure the charge-parity violating angle in the neutrino sector. DUNE will constrain systematic uncertainties by building a suite of detectors close to the neutrino source (near detector) and another at a distance of 1300km away (far detector). In DUNE, this Near Detector suite consists of three main components. Here the focus will lie on the Liquid Argon Near Detector or ND-LAr, which is built with a novel pixelated charge readout system. ND-LAr is a modular design of 35 identical LAr TPCs assembled in a 7 by 5 array. To prove the viability of this concept, a chain of prototypes has been constructed and tested with cosmic rays; From singular modules (60cm x 120cm x 60cm) to ultimately combining them in a 2x2 array in the NuMI neutrino beam at Fermilab. With a pixel pitch of 4.4mm in three of the four modules and a pitch of 3.8mm in the fourth, there are more than 300k readout channels across the 8 drift volumes. This talk will describe the characteristics of these modules and their responses to incoming charged particles by studying the pixel performance and the particle track widths. These studies will help us understand the differences between the modules in terms of the respective drift fields applied within them and the charge collection efficiencies.

Keyword-1

Neutrino

Keyword-2

Detection

Keyword-3

Author: ZAKI, Rowan

Presenter: ZAKI, Rowan

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