Contribution ID: **1099** Type: **Poster**

Determination of time and position of muon tracks with the help of light collecting system in liquid argon near detector of the DUNE experiment

Monday, 24 October 2022 19:55 (5 minutes)

Since the first detection of neutrino in 1956, scientists have discovered that there are three kinds (or flavors) of neutrino particles, that these particles have mass (in defiance of the Standard Model), and that they oscillate between the three types as they travel. Deep Underground Neutrino Experiment (DUNE) will be the world' s most advanced and comprehensive experiment dedicated to understanding these particles. It includes two detection systems: near detector (ND) and far detector (FD). ND will be placed near the Long-Baseline Neutrino Facility (LBNF) and will allow scientists to examine the composition of the neutrino beam just after its creation. One of the main parts of ND are the liquid argon time-projection chambers (LArTPCs) combined with the light readout systems (LRS). The LRS provides fast timing information from the prompt scintillation light (at ~128 nm) emitted by charged particles traversing LAr. The optical detection of scintillation photons provides both an absolute reference (t0) and rejection of unassociated charge signals (pile-up) from the specific neutrino signals of interest. The LRS consists of two SiPM-based systems: the Light Collection Module (LCM) and the ArCLight module. The LCM light traps provide high collection efficiency and are to be used for accurate scintillation amplitude and energy reconstruction. The ArCLight light trap provides good position sensitivity and are used for accurate scintillation position reconstruction. Both the reconstructed energy and position will be useful for pile-up rejection. In my work, an overview of the DUNE experiment will be provided and an algorithm for processing data obtained by modeling the operation of LCM and ArCLight systems will be described.

Primary author: LENSKY, Peter

Co-author: CHUKANOV, Artem (JINR)

Presenter: LENSKY, Peter

Session Classification: In-person poster session & welcome drinks

Track Classification: High Energy Physics