

Photo-Detectors readout in the 2nd DUNE Far Detector: readout in cryogenic and high voltage environment

Tuesday, June 18, 2024 5:30 PM (2 hours)

The Deep Underground Neutrino Experiment (DUNE) is a next generation long baseline neutrino experiment aiming to provide insight towards the main outstanding questions in neutrino physics. It will operate four enormous far detector modules, placed 1300 km from the baseline 1.5 km underground.

The second of these far detectors will consist of a Liquid Argon Time Projection Chamber (LArTPC), as well as a Photo-Detection (PD) System that will provide complementary information for timing, position reconstruction and calorimetry. The work presented here concerns the PD system, presenting the design of its readout electronics. To enhance the coverage of the PD system and improve its uniformity, detectors will be positioned on the high voltage surface of the cathode. A "Signal-over-Fiber" concept was thus developed, to transmit the signals using only non-conductive materials. It is complemented by a "Power-over-Fiber" technology that allows to power these electronics using powerful lasers. This poster presents the design and the characterisation of these electronics, as well as the results of the integration tests carried out at the CERN Neutrino Platform.

Poster prize

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Session Classification: Poster session and reception 1

Track Classification: New technologies for neutrino physics