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Light detection with power and signal transmission over fiber.

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The Deep Underground Neutrino Experiment (DUNE) is a massive long baseline (1300 km) neutrino experiment that aims to shed light on some of the major open questions in neutrino physics. The neutrino beam measurements will be performed by a near detector (ND) and far detector (FD). The far detector will consist of four modules, installed 1,5 km deep underground, based Liquid Argon Time Projection Chamber (LArTPC) technology to detect particles.

The Vertical Drift (VD) LArTPC is a recent technology proposed by the DUNE Collaboration for the second FD module. In vertical drift, light collection will be optimized by installing photon detectors in the LArTPC's cathode, which is biased at -300 kV. This imposes a constraint that the Photon Detection System (PDS) must have power and signal transmission through non-conductive materials. The proposed solution is to use Power-over-Fiber (PoF) and Signal-over-Fiber (SoF). An intense validation of the system is being performed by the Collaboration at the CERN Neutrino Platform, this talk will present the matured design and results of the data collected over the first half of 2022.

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