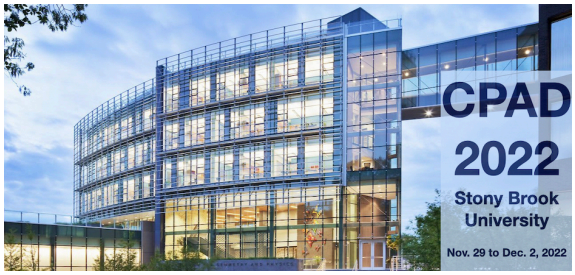

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Signal over fiber and power over fiber transmission: a new concept for the PDS in DUNE VD

Tuesday, 29 November 2022 14:30 (20 minutes)

(on behalf of DUNE PhotonDetector Consortium)
The Deep Underground Neutrino Experiment (DUNE) is currently investigating a new prototype design for its second Far Detector module. The new concept proposes a Vertical Drift (VD) LArTPC, with a cathode at mid-height in the detector and anodes made of printed circuit boards (PCB), located at the top and bottom of the detector volume. The photon detection system (PDS) will make use of large size X-Arapuca tiles distributed over the cathode, as well behind the file cage. This layout does not allow to accommodate the PDS behind the anode plane, as in traditional LArTPCs, due to the opacity to light of the PCB plane structure. The new concept of operating on the high voltage cathode plane requires PDS cathode-mounted modules to be electrically isolated from the external readout electronics. To meet this challenging constraint, photosensors and front-end electronics will be powered and rad-out using novel power over fiber and signal over fiber technologies respectively, thus providing the desired electrical isolation (and also noise immunity).

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