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# #1-107 Charge signal formation in the TPC Vertical Drift design of DUNE

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Giant Liquid Argon Time-Projection Chambers will be used for the far detectors of the next generation of neutrino oscillation experiment: Deep Underground Neutrino Experiment (DUNE). This work focuses on design of the Vertical Drift module (VD), where the chamber consists of two drift volumes separated by a central cathode allowing a nominal electric field of 500 V/cm in each of them. The electrons produced by the ionisation of argon atoms by charged particles passing through the chamber will drift to two independent anode planes located at the top and at the bottom of the detector. A distinct feature of this TPC design is the use of a new type of anode made by a stack of perforated print circuit boards with etched channel strips. This new anode enables the detection of the ionization electrons through two inductions views and a charge collection view. Extensive R&D has been carried out at CERN in the past years to optimize the VD anode design. In this presentation, I will present the numerical simulations of the signal formation on all induction views of the anodes based on the Shockley-Ramo's theorem and the physics of charge carriers'motion on liquid argon. Comparisons with cosmic data taken at CERN with prototypes will be presented. A good understanding of the collected signal shape and strength is essential to achieve the track reconstruction efficiency and calorimetric measurement resolution needed by the DUNE experiment to study neutrino oscillations.

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