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## Measuring electron drift-velocity in ProtoDUNE-SP using anode-anode crossing cosmic ray muon tracks

*Monday, July 20, 2020 11:00 AM (15 minutes)*

ProtoDUNE-SP is a Liquid Argon Time Projection Chamber(LArTPC) built at the CERN neutrino platform. It has two drift volumes with cathode plane at the center and an anode plane on either side of it. In ProtoDUNE-SP, space charge effect distorts the drift electric field and the drift velocity. Here we measure the drift velocity using tracks that cross both the anodes. Track start and end points are undistorted for such tracks. We further require the tracks to be confined to the central region of the TPC in order to minimize the spatial distortion in direction transverse to the drift direction. In addition, we remove any remaining transverse spatial distortion using a correction map we developed using anode-anode tracks. Drift distance for each point on the trajectory is determined using the wire numbers corresponding to the trajectory points. Drift velocity is then determined by taking the ratio of the change in drift distance to the change in drift time as a function of drift distance. Drift velocity variation of within 20% of the nominal value is observed using this method.

### Summary

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