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Towards an Inelastic Cross Section Measurement of 6 GeV Kaons at ProtoDUNE Single-Phase

The Deep Underground Neutrino Experiment (DUNE) is a long-baseline neutrino oscillation experiment using liquid argon time projection chamber (LArTPC) technology. DUNE will have four Far Detector modules that will be low enough underground and with enough fiducial mass to search for nucleon decay and collect samples of atmospheric, cosmic, and solar neutrinos. To benchmark Far Detector performance, DUNE constructed the ProtoDUNE Single-Phase detector, an approximately 700 ton liquid argon time projection chamber (TPC) under a charged particle test beam at the CERN Neutrino Platform. The test beam generates high energy kaons which are of interest for DUNE's nucleon decay and atmospheric neutrino programs. To better understand kaons, the kaon inelastic cross section on argon at approximately 6 GeV was investigated by selecting beam kaons tagged with the beamline monitoring system. This poster will introduce the inelastic kaon cross section at a high test beam energy, including the methodology.

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