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Measurement of pion cross-section in ProtoDUNE SP detector at CERN

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The ProtoDUNE-SP detector is a single-phase liquid argon time projection chamber with an active volume of 7.2×6.0×6.9 m^3. It takes a specially-constructed beam that delivers multiple kinds of particles including charged pions, kaons, protons, muons and electrons with momenta in the range 0.3 GeV/c to 7 GeV/c. The ProtoDUNE-SP detector also serves as a prototype for the first far detector module of the Deep Underground Neutrino Experiment. We present algorithms for particle identification (protons, pions, and showers) in the protoDUNE pion beam events and a scheme to select pion absorption & charge exchange processes based on our particle identification.
In addition, a detailed research plan of cross-section measurement and nuclear effect study will be presented.

Summary

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