

Abstract Submitted
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First results of the liquid-argon time-projection chamber response to medium-energy neutrons and the CAPTAIN program
CHRISTOPHER MAUGER¹, Univ of Pennsylvania, CAPTAIN COLLABORATION — The Cryogenic Apparatus for Precision Tests of Argon Interactions with Neutrinos (CAPTAIN) program makes measurements that are crucial for the future DUNE experiment. DUNE aims to study neutrino oscillation phenomena with very high precision with long-baseline and atmospheric neutrinos. In addition, DUNE will measure the time and energy-dependent electron-neutrino spectrum from galactic core-collapse supernovae if the neutrinos pass through the earth during the lifetime of the experiment. CAPTAIN addresses challenges with both of these programs by making measurements of the liquid-argon time-projection chamber (LArTPC) response to medium-energy neutrons and by measuring the electron-neutrino on argon cross-section in an energy regime coincident with the neutrino spectrum expected from core-collapse supernova. First, we have deployed Mini-CAPTAIN, a 400-kg instrumented-mass LArTPC, in a neutron beamline at the Los Alamos Neutron Science Center that provides neutrons of energies up to 800 MeV. I report the first results of these measurements and their implications for DUNE's long-baseline neutrino oscillation program. I further describe the plans for low-energy neutrino measurements with the 5-ton CAPTAIN detector.

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