

Measuring Electron Neutrino Charged-Current interactions on Argon at 10-50 MeV with the COHERENT 750 kg Detector

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Measurements of electron neutrino charged-current interactions on Argon from 10-50 MeV are few but are important for future experiments and theoretical modeling of nuclei. Knowledge of the cross section at these energies will be critical in the event that the upcoming Deep Underground Neutrino Experiment (DUNE) observes neutrinos from a galactic supernova. Uncertainties on the cross sections will impact what can be concluded about both the dynamics of supernovae and the properties of neutrinos. Differential cross sections will also provide relevant data for ongoing theoretical work on modeling the transitions between nuclear states. The COHERENT collaboration is currently constructing a 750 kg single-phase liquid argon scintillator detector to study neutrinos coming from the Spallation Neutron Source (SNS) located at Oak Ridge National Laboratory (ORNL). In addition to producing a high-intensity flux of neutrons, the SNS also emits an intense source of neutrinos coming primarily from pion decay-at-rest. These neutrinos are emitted at an energy well matched to the regime of interest (10-50 MeV). This poster will discuss the status and timeline of the future 750 kg liquid argon scintillator detector along with a discussion on various aspects of the measurement.

Poster prize

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