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Argon Resonant Transport Interaction Experiment

The Argon Resonant Transport Interaction Experiment (ARTIE) was recently performed at the Time-of-Flight neutron beam at Los Alamos National Laboratory. ARTIE makes a new measurement of the total cross-section of neutrons on natural argon between 40-70 keV. In this energy range, the ENDF evaluation predicts an anti-resonance in the Ar-40 cross-section near 57 keV. However, this is not supported by a previous measurement performed in the 90s. ARTIE measures the transmission coefficient of the neutron beam traveling through a liquid argon target. The goal is to resolve the discrepancy between the cross-sections made with the ENDF evaluation and the previous data. This measurement is crucial for the Deep Underground Neutrino Experiment (DUNE) as it determines the feasibility of the neutron-based detector calibration technique and provides a deeper understanding of signals and backgrounds for the low energy physics programs.

Mini-abstract

ARTIE makes a new measurement of the neutron total cross-section on natural argon between 40-70 keV.

Experiment/Collaboration

Deep Underground Neutrino Experiment

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