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Plenary Talk: Status of the COHERENT experiment

Tuesday, June 24, 2025 1:30 PM (30 minutes)

Author and Speaker: Daniel Pershey

Abstract: The COHERENT collaboration made the first measurement of coherent elastic neutrino nucleus scattering (CEvNS) in 2017 using a low-background, 14.6-kg CsI[Na] detector at the Spallation Neutron Source (SNS). We have also measured CEvNS using a 24-kg argon scintillation calorimeter and an 18-kg array of Ge PPC detectors. These measurements are part of a multi-target campaign to measure CEvNS on four nuclei, Na, Ar, Ge, and Cs/I, to test the standard model cross section, predicted to scale like the square of the neutron number. We will show current progress in deployment of new COHERENT detectors, including those that will study CEvNS on Na and Ge.

Beyond CEvNS, ongoing efforts to measure inelastic scattering processes will be detailed. With a variety of detector nuclei instrumented at the SNS, COHERENT can test low-energy nuclear scattering models by studying several processes not yet measured. We will present new results demonstrating COHERENT's potential to understand inelastic neutrino scattering processes vital to the success of other high-energy experiments.

With first-light discovery of CEvNS accomplished, COHERENT is now transitioning to precision measurements of CEvNS and other low-energy neutrino scattering processes. In this talk, we describe the past, current, and future efforts to measure CEvNS and elastics at the SNS.

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