

Neutrino interactions with a ton-scale liquid argon detector for the COHERENT experiment

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The COHERENT collaboration operates an array of detectors at the ORNL Spallation Neutron Source (SNS) to measure coherent elastic neutrino nucleus scattering (CEvNS), low-energy inelastic neutrino interactions, and to search for dark matter. We observed the first CEvNS events in 2017 with a cesium-iodide scintillation detector. We followed up with a measurement using a 24 kg liquid argon detector (CENNS-10) thus confirming the CEvNS hypothesis. COHERENT is expanding in the next years with more detectors to increase the precision of those results thur increasing our physics reach into beyond-standard-model physics tests. As part of that, we are building a 750 kg liquid argon scintillation detector (COHAr-750) that will increase the event rate substantially to allow precision measurements of the CEvNS process as well as allow sensitivity to inelastic neutrino processes and accelerator-produced dark-matter. In this talk we will present the physics topics that will be investigated along with design details of COHAr-750.

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