

Contribution ID: 19

Type: **not specified**

New physics potential using coherent, low-energy neutrino scattering

Monday, July 3, 2023 10:00 AM (45 minutes)

Coherent, elastic neutrino-nucleus scattering (CEvNS) is a low- Q^2 neutrino interaction channel, with the neutrino transferring a small, but experimentally detectable, kinetic energy to the nucleus. The first measurement of CEvNS was achieved using the Spallation Neutron Source (SNS) at Oak Ridge National Laboratory by the COHERENT experiment using a 14.6-kg CsI[Na] scintillation crystal. Due to its large and precisely predicted scattering cross section, CEvNS received significant interest for potential discovery of new physics beyond the standard model. In this talk, we discuss first-light CEvNS measurements on CsI and Ar along with future experimental plans precisely measure the process at the multi-ton scale with emphasis on potential constraints of BSM physics. Among topics we will cover are searches for BSM neutrino interactions, limits on sterile neutrinos and exotic oscillations, and searches for dark matter. These large detectors will also allow for a measurement of the weak mixing angle at low Q^2 and measurement of the weak charge distribution in of target nuclei.

Primary author: PERSHEY, Daniel (Duke University)

Presenter: PERSHEY, Daniel (Duke University)