

Abstract Submitted
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Design of a D₂O Detector for Flux Normalization at a Pion Decay-at-Rest Neutrino Source¹ MATTHEW HEATH, Oak Ridge National Lab, COHERENT COLLABORATION — Precision measurements of coherent elastic neutrino-nucleus scattering (CEvNS) will allow a broad collection of physics studies ranging from improving constraints on non-standard neutrino interactions to probing nuclear structure. Following initial CEvNS measurements on CsI and Ar, the COHERENT experiment is entering an era of precision measurements. Current COHERENT measurements are limited by the 10 % uncertainty on the neutrino flux from the pion decay-at-rest neutrino source at the Oak Ridge National Laboratory Spallation Neutron Source (SNS). To reduce this uncertainty, a 592 kg heavy-water demonstrator has been designed to measure the absolute neutrino flux from the SNS making use of the well-understood $D + \nu_e$ cross section. The first of a planned 2-detector module, the demonstrator will measure the neutrino flux with better than 5 % statistical precision in 2 SNS-years of running. In this talk I will present the D₂O detector design and discuss the expanded physics sensitivity of CEvNS detectors at the SNS with an improved understanding of the neutrino flux.

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