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A Flux Normalization Detector for the COHERENT Experiment

The COHERENT Collaboration recently made the first observation of the Coherent Elastic Neutrino-Nucleus Scattering (CEvNS) process by using neutrinos produced in the Spallation Neutron Source (SNS) at Oak Ridge National Laboratory. CEvNS measurements are expected to have significant impact on many areas of physics, which has motivated COHERENT to attempt precision measurements on a variety of different nuclei. With COHERENT entering into a high precision program, the current 10% uncertainty on the neutrino flux is the largest systematic error and it needs to be reduced. We plan to do this by using a heavy water detector to directly measure the neutrino flux which takes advantage of the well-understood charged current interaction of electron neutrinos on deuterium. This poster will present an overview of the heavy water detector design studies and proposals to build and deploy this detector in the near future.

Mini-abstract

A D₂O detector will improve the current neutrino flux uncertainty for all COHERENT analyses.

Experiment/Collaboration

COHERENT

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