



Contribution ID: 466

Type: **not specified**

Status of the D2O Detector for the COHERENT Experiment

Tuesday 14 May 2024 16:30 (15 minutes)

The COHERENT collaboration made the first measurement of coherent elastic neutrino-nucleus scattering (CEvNS) and did so by employing neutrinos produced by the Spallation Neutron Source (SNS) at Oak Ridge National Laboratory (ORNL). The uncertainty of the neutrino flux generated from the SNS is on the order of 10% making it one of COHERENT's most dominant systematic uncertainties. To address this issue, a heavy water (D2O) detector has been designed to measure the neutrino flux through the well-understood electron neutrino-deuterium interaction. The D2O detector is composed of two identical modules designed to detect Cherenkov photons generated inside the target tank with Module 1 containing D2O as the target and Module 2 initially containing H2O for comparison and background subtraction. We also aim to make a measurement of the cross-section of the charged-current interaction between the electron neutrino and oxygen, providing valuable insight for supernova detection in existing and future large water Cherenkov detectors. In this talk, we present the construction and commissioning updates for Module 2 along with some preliminary results from Module 1.

Mini Symposia (Invited Talks Only)

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Session Classification: Neutrino Physics

Track Classification: Neutrino Physics