

Module 2 of the COHERENT D2O Detector

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The COHERENT collaboration's measurements of CEvNS utilize 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 across all detectors. 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 which has the potential to lower the uncertainty to 2-3%. 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 poster, we present construction and commissioning updates for Module 2 of the D2O detector.

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