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The COHERENT Experiment

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COHERENT is a multi-detector experiment measuring the Coherent Elastic neutrino-Nucleus Scattering (CEvNS) cross section on several target nuclei using a stopped-pion neutrino flux generated at the Spallation Neutron Source (SNS) at Oak Ridge. Despite having a very large cross section, CEvNS had not been observed for four decades after the process was theoretically postulated due to the difficulty detecting the keV-scale nuclear recoil signature. CEvNS were first observed with the COHERENT CsI detector, 14.6 kg of scintillating crystal. In this talk, we detail the CsI result along with ongoing efforts to measure CEvNS on different nuclear targets: Ar, Ge, and Na. Additionally, we discuss our sensitivity to a broad range of physics beyond the standard model such as neutrino non-standard interactions, constraints on the dark matter flux generated by the SNS, and measurement of the weak mixing angle at low- Q^2 .

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