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The COHERENT experiment

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Coherent elastic neutrino nucleus scattering (CEvNS) is a fundamental process within the Standard Model which was observed for the first time in 2017 by the COHERENT experiment on the CsI target at the Spallation Neutron Source (SNS) located in Oak Ridge National Laboratory (USA). This process cross section prevails over the cross sections of all other known neutrino interactions with heavy nuclei within the energy range below 50 MeV due to its dependence on square number of neutrons in the nucleus. The main goal of COHERENT is to measure CEvNS on different targets and to explore related physics opportunities in the neutrino and BSM physics. After the first observation COHERENT has also succeeded in detection of CEvNS on Ar and Ge targets with the latter in 2023.

In this talk we describe the current status of CEvNS study in the COHERENT experiment and talk about efforts to measure inelastic neutrino interactions with Ar, I, O, Pb and Th nuclei. We update our program for neutrino flux measurements at SNS with heavy water detectors. We also present other COHERENT efforts and the search for sterile neutrinos at the Second Target Station of SNS.

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