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Status and perspective of ICARUS at the Fermilab Short-Baseline Neutrino Program

Thursday 24 August 2023 10:10 (20 minutes)

The ICARUS collaboration has employed the 760-ton T600 detector in a successful three-year physics run at the underground LNGS laboratory, performing a sensitive search for LSND-like anomalous ν_e appearance in the CNGS beam, contributing to the constraints on the allowed neutrino oscillation parameters to a narrow region around 1 eV^2. After a significant overhaul at CERN, the T600 detector has been installed at Fermilab. Following the cryogenic commissioning, in 2020 ICARUS started its operation collecting the first neutrino events from the Booster Neutrino Beam (BNB) and the Neutrinos at the Main Injector (NuMI) beam off-axis, which were used to test the ICARUS event selection, reconstruction and analysis algorithms. ICARUS completed its commissioning phase in June 2022, moving then to data taking for neutrino oscillation physics, aiming at first to either confirm or refute the claim by Neutrino-4 short-baseline reactor experiment. ICARUS will also perform measurements of neutrino cross sections with the NuMI beam and several Beyond Standard Model searches. After the first year of operations, ICARUS will jointly search for evidence of sterile neutrinos with the Short-Baseline Near Detector (SBND), within the Short-Baseline Neutrino (SBN) program. In this presentation, preliminary technical results from the data with the BNB and NuMI beams are presented both in terms of performance of all ICARUS subsystems and its capability to select and reconstruct neutrino events.

Collaboration / Activity

ICARUS Collaboration

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