Contribution ID: **81** Type: **Invited Talk: in-person**

First Results of the ICARUS Experiment at Fermilab

Thursday, 19 September 2024 14:05 (20 minutes)

The ICARUS collaboration first employed the 760-ton T600 detector in a successful three-year physics run at the underground LNGS laboratory in the CERN Neutrino to Gran Sasso beam. Then after a significant overhaul at CERN, the T600 detector was installed at Fermilab as the far detector for the Short-Baseline Neutrino (SBN) Program at Fermilab. The SBN program is designed to definitively test the sterile neutrino hypothesis of the MiniBooNE anomaly with the Short-Baseline Near Detector (SBND) and ICARUS. The cryogenic cool down, liquid argon fill, and detector commissioning began in 2020 and the commissioning period completed in 2022. ICARUS collects neutrino events from both the Booster Neutrino Beam (BNB) and the Neutrinos at the Main Injector (NuMI) beam off-axis at Fermilab. The physics goals of the initial BNB data is a single-detector sterile oscillation measurement to set the stage for a joint analysis using ICARUS and SBND in the future. ICARUS can also perform neutrino-argon cross section measurements and Beyond the Standard Model physics searches using the NuMI beam off-axis. In this talk, the first results from ICARUS data taken with both the BNB and NuMI beams are presented, showing the ability of the ICARUS detector to select and reconstruct neutrino events from the beams.

Working Group

WG 1: Neutrino Oscillation Physics

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Session Classification: Parallel: WG5

Track Classification: WG5: Neutrino Beyond PMNS