



Contribution ID: 16

Type: **Short talk (15min. + 5 min. Q/A)**

Performance of Muon Neutrino Reconstruction at ICARUS using SPINE Machine Learning

Wednesday 29 October 2025 15:45 (15 minutes)

ICARUS is a liquid argon time projection chamber (LArTPC) neutrino experiment at Fermilab. Located ~600 m from the Booster Neutrino Beam (BNB) target, it serves as the far detector in the Short-Baseline Neutrino (SBN) Program. The primary objective of the SBN Program is to probe neutrino oscillation physics at short baselines using multiple detectors, including measurements of both muon neutrino disappearance and electron neutrino appearance. A key requirement for the neutrino oscillation measurements is robust event reconstruction, including accurate and precise particle identification (PID) and kinematic reconstruction across a wide range of topologies. To achieve the required performance, we employ the SPINE ("Scalable Particle Imaging with Neural Embeddings") package, a state-of-the-art machine learning reconstruction framework. This talk presents the status of muon neutrino reconstruction using SPINE at ICARUS, including the evaluation of reconstruction performance that will enable the full physics program at ICARUS and at the SBN Program.

Presenter: TOTANI, Dante

Session Classification: Experiments - SBN