Joshua Isaacson – HEP Seminar – September 9, 2025
MSU

Title: Single pion-production and pion propagation in Achilles

Abstract:

Understanding how neutrinos interact with nuclei is key for current and future experiments. One important process is single-pion production, which plays a major role in how detectors see neutrino events. In this talk, I'll describe recent work extending the Achilles event generator to include single-pion production in a fully exclusive way. Our approach combines a state-of-the-art model of the electroweak interaction with realistic descriptions of nuclear structure and final-state interactions. We explore different ways to handle pion absorption, either through optical potentials or by explicitly tracking resonances inside the nucleus. I'll show how these methods compare with pion–nucleus scattering data and with measurements from electron and neutrino experiments such as T2K, MINERvA, and MicroBooNE.