

Status of ICARUS-NuMI interaction cross-section analysis

venerdì 21 giugno 2024 17:30 (2 ore)

The ICARUS experiment, utilizing Liquid Argon Time Projection Chamber (LAr TPC) technology, has been installed at Fermilab in Chicago, Illinois, following its initial operation in Italy and subsequent refurbishment at CERN. ICARUS completed commissioning in June 2022. Currently, the experiment is in the phase of analyzing data from its two runs of physics data acquisition and gearing up for the third run. While its primary objective is to function as the far detector of the Short Baseline Neutrino program (SBN), seeking sterile neutrino signatures, ICARUS also offers diverse physics capabilities, including searches beyond the standard model and measurements of cross-sections. In addition to being exposed to the common Booster Neutrino (BNB) beamline, ICARUS also receives off-axis neutrinos from the Main Injector (NuMI) beam. Due to the off-axis angle between NuMI and ICARUS, coupled with contributions from both pion and kaon decays to neutrino fluxes, interactions of NuMI neutrinos within ICARUS can be detected over a range of several GeV in energy. These interactions present opportunities for crucial cross-section measurements and model tests within an energy range that overlaps both the SBN oscillation search and a portion of the DUNE spectrum. This poster presentation will delve into our efforts to conduct a muon-neutrino cross-section measurement, where the signal is defined by events with no pions produced in the final state of the interaction, along with some preliminary muon-neutrino inclusive measurements. Additionally, it will provide updates on the current status and future plans, including reconstruction, selection, and analysis procedures.

Poster prize

Yes

Given name

Promita

Surname

Roy

First affiliation

Centre for Neutrino Physics, Virginia Tech, Blacksburg, VA-24061, USA

Second affiliation

Institutional email

promita@vt.edu

Gender

Female

Collaboration (if any)

Autori principali: Dr. HOWARD, Bruce (Fermilab); Sig.na MORENO, Guadalupe (CINVESTAV); Sig. SMEDLEY, Jack (University of Rochester); Dr. KIM, Jaesung (University of Rochester); Dr. BETANCOURT, Minerba (Fermilab); ROY, Promita (Centre for Neutrino Physics, Virginia tech)

Relatore: ROY, Promita (Centre for Neutrino Physics, Virginia tech)

Classifica Sessioni: Poster session and reception 2

Classificazione della track: Neutrino interactions