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Neutrino reconstruction analysis at ICARUS detector

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Liquid Argon Time Projection Chamber (LArTPC) detectors offer impressive charged particle imaging capability with high spatial resolution. Precise event reconstruction procedures are mandatory in order to fully exploit the potential of this technology.

The ICARUS collaboration employed the 760-ton T600 detector in a successful three-year physics run at the underground LNGS laboratory. A sensitive search was performed for LSND-like anomalous ν_e appearance in the CNGS beam, contributing to the constraints on the allowed neutrino oscillation parameters within a narrow region around 1 eV^2. Following a significant overhaul at CERN, the T600 detector was relocated to Fermilab to begin to operate as the far detector in the Short-Baseline Neutrino Program (SBN). ICARUS has entered the physics run phase and is presently collecting large statistical samples for its proposed physics analysis program.

This poster will present ICARUS event selection along with the currently employed reconstruction and analysis algorithms. Initial studies have been conducted with a well defined sample of $\nu_\mu \, CC$ quasi elastic interactions, demonstrating promising and robust results of fully reconstructed neutrino events. Detailed investigations are undergoing to develop an efficient and automatic selection towards a final oscillation analysis, the status of which will also be reported here.

Poster prize

Yes

Given name

Maria

Surname

Artero Pons

First affiliation

Universita degli studi di Padova

Second affiliation

INFN Padova

Institutional email

maria.arteropons@pd.infn.it

Gender

Female

Collaboration (if any)

ICARUS Collaboration

Primary author: ARTERO PONS, Maria (Istituto Nazionale di Fisica Nucleare)

Presenter: ARTERO PONS, Maria (Istituto Nazionale di Fisica Nucleare)

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