



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 3644

Type: Oral (Non-Student) / Orale (non-étudiant(e))

Measurement of antineutrino elastic scattering on free protons in the MINERvA experiment

Wednesday 21 June 2023 14:45 (15 minutes)

Antineutrino scattering on free protons (or neutrino scattering off free neutrons) gives a unique measurement of neutron and proton structure and is a building block for predicting neutrino scattering on more complex nuclei. Previous measurements have to rely on scattering neutrinos off deuterium and then correcting for nuclear effects, or by low-intensity anti-neutrino beams. In this talk, MINERvA will present the first high statistics cross section measurement of the charged current elastic process $\bar{\nu}_\mu p \rightarrow \mu + n$ using the plastic scintillator (CH). The carbon background is significantly reduced and constrained with minimal model dependency using the kinematics of the reconstructed neutrons. The result can be directly compared with lattice QCD computations, and to electron scattering off free protons.

Keyword-1

neutrino

Keyword-2

nucleon

Keyword-3

elastic

Author: CAI, Tejin

Presenter: ROY, Noe (York University)

Session Classification: (PPD) W2-1 DM / Neutrino 3 | DM / Neutrino 3 (PPD)

Track Classification: Technical Sessions / Sessions techniques: Particle Physics / Physique des particules (PPD)