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Contribution ID: 3699 Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Antineutrino Charged Current Cross Sections at MINERvA

Wednesday 21 June 2023 15:45 (15 minutes)

This analysis will make a measurement of the inclusive charged current anti-neutrino cross section on hydrocarbon as a function of muon kinematics. This measurement is being made with an unprecedented 1.8 million data events which have been recorded in the MINERvA detector [1]. The goal of the MINERvA experiment is to make high precision cross section measurements on various nuclei. There were 10.7×10^{20} protons on target in the NuMI beamline [2] yielding a beam of anti-neutrinos with an energy peaking at 6 GeV. A very well constrained flux prediction developed using neutrino-electron elastic scattering and inverse muon decay has been employed to constrain the uncertainty on the anti-neutrino flux. Both single and double differential cross sections in muon transverse and longitudinal momentum are reported. Motivation for making a measurement in these variables stems from great detector resolution for muon kinematics. The cross-section measurements made by the MINERvA experiment will constrain the models that feed into the next generation of experiments which are neutrino oscillation experiments.

[1] Design, calibration, and performance of the MINERvA detector MINERvA Collaboration • L. Aliaga (William-Mary Coll.) et al. DOI: <https://doi.org/10.1016/j.nima.2013.12.053> Published in: Nucl.Instrum.Meth.A 743 (2014), 130-159

[2] The NuMI Neutrino Beam P. Adamson (Fermilab), K. Anderson (Fermilab), M. Andrews (Fermilab), R. Andrews (Fermilab), I. Anghel (Iowa State U. and Argonne) et al. e-Print: 1507.06690 [physics.acc-ph] DOI: 10.1016/j.nima.2015.08.063 Published in: Nucl.Instrum.Meth.A 806 (2016), 279-306

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MINERvA experiment

Keyword-2

cross section measurement

Keyword-3

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