

New Perspectives



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Nuclear medium effects in the antineutrino induced deep inelastic scattering for $\langle E_{\bar{\nu}_\mu} \rangle \sim 6\text{GeV}$ at MINER ν A

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For a better understanding of neutrino properties, we require precision measurements of the oscillation parameters. Presently the systematic uncertainty on these parameters can be as large 25-30% because of the lack of understanding of neutrino-nucleon and neutrino-nucleus cross sections. For future high precision measurements we will need to reduce this uncertainty down to 2-3%. MINER ν A is a dedicated (anti)neutrino scattering experiment located in the NuMI beamline at Fermilab. Currently the results for the medium energy run of MINER ν A are being analyzed for inclusive as well as exclusive channels. We will present the preliminary results for charged current antineutrino deep inelastic scattering (DIS) observed at MINER ν A. For this study we used a sample of antineutrino interactions on several nuclear targets including iron, lead, carbon and hydrocarbon using the high intensity NuMI antineutrino beam with ~ 6 GeV. We will discuss the sample selection and the background estimation in the passive nuclear targets as well as in the active tracker region. The ultimate goal is to extract the cross section ratios and perform an expanded partonic nuclear effects study in the weak sector for the first time.

Presenter: ANSARI, Vaniya (Aligarh Muslim University)

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