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Background study in $\bar{\nu}_\mu - A$ DIS scattering in MINERνA Experiment

Tuesday 13 December 2022 14:00 (1 hour)

MINERvA is a dedicated (anti)neutrino experiment performed using $(\bar{\nu}_\mu)\nu_\mu$ beam with different nuclear targets and the aim is to study neutrino interactions and nuclear medium effects in the wide range of Bjorken x and four momentum transfer squared Q^2. The study would not only be helpful in understanding the hadron dynamics in the nuclear medium but also it will be useful in reducing the systematics in neutrino oscillation experiments being performed worldwide with accelerator and atmospheric neutrinos.
It is very important to separate the signal and background events for the accurate measurement of DIS cross section in the nuclear target region. In this analysis, we select the signal as all charge current antineutrino events that are in given material with muon energy 2-50GeV and passes the true DIS cuts ($Q^2 \geq 1GeV^2$ and $W \geq 2GeV$) and all other events are background. The background is categorized based on the position of the interaction vertex in the detector and events passing the kinematical variables cut.
Once we fix the background events then the results would be obtained for double differential scattering cross section in DIS region.
We shall present the preliminary results of the analysis being performed to estimate the background in anti-neutrino nucleus double differential DIS cross section in the intermediate energy region (average $E_{\bar{\nu}_\mu} \sim 6$ GeV) with $\bar{\nu}_\mu$ beam in MINERvA.

Session

Neutrino Physics

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