Contribution ID: **11** Type: **not specified**

MINERvA's experience of cross-section extraction methods

Tuesday 3 October 2023 11:00 (20 minutes)

MINERvA is a dedicated neutrino-nucleus cross section experiment at Fermilab in the NuMI (anti)neutrino beamline, where it was exposed to both low and medium energy configurations with a neutrino energy spectrum ranging from a few GeV to tens of GeV. The large high statistics in the data are complemented by a large simulated sample, and their comparison allows MINERvA to probe nuclear structure and test interaction models important for oscillation experiments. Analyzers in MINERvA extract inclusive and exclusive cross sections with a comprehensive accounting of systematic uncertainty, making use of various methods of data driven background constraint, and reporting cross section data at the truth level by utilizing the D'Agostini method of iterative Bayesian unfolding. Other methods of unfolding have been proposed and explored (e.g., singular value decomposition) in MINERvA, however the D'Agostini method remains standard in the collaboration's published results. An overview of the methods used in MINERvA cross section extraction and results will be presented.

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Session Classification: Experiment Overview