Contribution ID: **12** Type: **not specified**

Semi-inclusive neutrino-nucleus scattering within the relativistic distorted wave approach

Thursday 2 October 2025 15:20 (20 minutes)

Nuclear effects in neutrino-nucleus scattering are one of the main sources of uncertainty in the analysis of neutrino oscillation experiments. Due to the extended neutrino energy distribution, very different reaction mechanisms contribute to the cross section at the same time. Measurements of muon momentum in CC0π events are very important for experiments like T2K, where most of the information about the oscillation signal comes from detection of the final-state muons only. However, those inclusive measurements make difficult to distinguish the contributions of nuclear effects. For instance, they do not allow to separate between different nuclear models and are not sufficient to put constraints on the amount of two-body current contributions. This is the reason why there is a growing interest in measurements of more exclusive processes, for instance the detection in coincidence of a muon and an ejected proton in the final state. Interpretation of such reactions, usually called semi-inclusive reactions, is challenging as it requires realistic models of the initial nuclear state and an appropriate description of proton final-state interactions.

In this talk we're going to present the theoretical predictions of semi-inclusive $\nu\mu$ cross sections on 12C and 40Ar obtained within an unfactorized approach based on the relativistic distorted wave impulse approximation (RDWIA) and compare them with T2K, MINERνA and MicroBooNE measurements and predictions of the inclusive SuSAv2-MEC model implemented in the neutrino event generator GENIE.

Author: FRANCO PATINO, Juan Manuel (University of Seville & University of Turin/INFN Turin.)

Presenter: FRANCO PATINO, Juan Manuel (University of Seville & University of Turin/INFN Turin.)

Session Classification: Short contributions (IV)