



Contribution ID: 33

Type: **Poster**

GiBUU-Based Monte Carlo Simulation for Neutrino Experiments

This poster presents a Monte Carlo simulation implemented with the GiBUU model tailored for neutrino experiments. Specifically, we focus on its implementation, generating events in a generic liquid argon time projection chamber and comparing them with other neutrino event generators such as GENIE. The simulation generates realistic neutrino event samples, contributing to the prediction and interpretation of experimental outcomes. Our results demonstrate the robust performance of the GiBUU-based simulation framework and validate its performance against the original GiBUU cross-section model. Additionally, we outline our current efforts in developing infrastructure to address systematic uncertainties in the GiBUU model. By advancing simulation techniques, implementing neutrino-nucleus scattering models following different physics approaches, and building techniques to address systematic uncertainties, this work contributes to the refinement and reliability of neutrino experimental analyses.

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Session Classification: Poster Session