

A Truth Study Using Transverse Variables to Characterise Nuclear Effects in neutrino–nucleus scattering.

In the past few years it has become clear that nuclear effects impose significant uncertainties on precision measurements in neutrino physics of the few GeV energy region.

A number of convoluted effects in the nuclear model, affecting both the initial nucleon momentum spectrum and intranuclear hadronic transport, result in different interaction types giving the same hadronic final state and also affects the hadronic kinematics.

This is a problem for both exclusive cross-section measurements and event-by-event energy reconstruction.

We propose the use of variables defined in a plane transverse to the incoming neutrino momenta to directly study such nuclear effects.

We focus on the predictions from four of the most commonly used neutrino event generators (GENIE, GiBUU, NEUT, and NuWro) including their predictions for the initial neutrino interaction model, the initial states of all particles in the interaction, and the final states.

Authors: PICKERING, Luke (Imperial College London); LU, Xianguo (Ruprecht-Karls-Universitaet Heidelberg (DE)); UCHIDA, Yoshi (Imperial College London)

Presenter: PICKERING, Luke (Imperial College London)

Track Classification: Aug/18