Contribution ID: **3** Type: **Talk**

Neutrino induced pion production at MiniBooNE and K2K within the GiBUU model

Friday 22 May 2009 09:00 (25 minutes)

A precise determination of neutrino oscillation parameters demands for an equally precise knowledge of the neutrino nucleus interaction process. Neutrino induced pion production is strongly influenced by nuclear effects. Their understanding is crucial since neutral current $\pi 0$ production is a major background in ν_e appearance experiments, while charged current π^+ production introduces a background to ν_μ disappearance searches.

We have investigated both, charged and neutral current neutrino induced pion production off nuclei, at MiniBooNE and K2K energies within the GiBUU transport model. Assuming impulse approximation, we treat the nucleus as a local Fermi gas of nucleons bound in a density and momentum potential. The outcome of the initial neutrino nucleon reaction undergoes complex hadronic final state interactions where in-medium spectral functions of the particles are taken into account. We present results for neutral current $\pi 0$ and charged current π^+ production and compare to first MiniBooNE and K2K data.

A correct understanding of neutrino induced pion production is also important for the reconstruction of the neutrino energy out of quasi-elastic scattering—events where the pion is absorbed in the nucleus might be misidentified as quasi-elastic and thus, modify the reconstructed energy leading to errors in the oscillation measurements.

Author: LEITNER, Tina (Universitaet Giessen)

Co-authors: ALVAREZ-RUSO, Luis (Universidad de Murcia); BUSS, Oliver (Universitaet Giessen); MOSEL, Ulrich (Universitaet Giessen)

Presenter: LEITNER, Tina (Universitaet Giessen)

Session Classification: Single pion production II

Track Classification: Single pion production