

## Single pion production induced by neutrino-nucleon interactions

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A proper prediction of the cross sections for single pion production in neutrino-nucleon scattering is an important ingredient of the long base-line oscillation experiment analysis (see experiments: K2K, MiniBooNE and T2K).

I will present the re-analysis of the single pion production data collected in the 12-ft ANL and 7-ft BNL bubble chamber experiments (neutrino-deuteron scattering data). It has been claimed that the ANL and BNL data are incompatible. In this presentation I will show that ANL and BNL data are consistent. The impact of the deuteron structure effect on the final fits will be also discussed.

The new consistent fit of the C5A axial form factor is the main result of our analysis. The fit is applied to the NuWro Monte Carlo (MC) generator and then used to predict  $\sigma(CC\pi^+)/\sigma(CCQE)$  ratio for the K2K and MiniBooNE experiments. We compute also the cross sections for the single  $\pi^0$  production in the neutral current neutrino-nucleon scattering. The neutral current  $\pi^0$  production is the dominant background to the measurement of the  $\nu\mu \rightarrow \nu e$  oscillation planned to be observed at the T2K experiment. The resulting cross sections are calculated together with the uncertainties coming from the uncertainties of the original experimental data.

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