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## Comparison of cross section models for neutrino-induced single pion production

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Neutrinos in the energy range from a few hundred MeV to several GeV are relevant for the study of neutrino oscillation by atmospheric neutrino observation and long baseline experiments. In this intermediate energy region charged-current quasi-elastic scattering (CCQE), single pion production, and deep inelastic scattering coexist with comparable contributions. The T2K experiment has been using CCQE events as the primary data sample to measure neutrino oscillations, but single pion production events are used as the signal in the recent analyses. Single pion production is crucial in the NOvA experiment and the future DUNE experiment as they measure the neutrino oscillation at higher energy than T2K with the longer baseline. Similarly, single pion production can be a background in proton decay searches at Super-Kamiokande and future experiments, including Hyper-Kamiokande. Therefore, it is important to understand the cross section and kinematics of single pion production to improve the precision of the neutrino oscillation parameter measurement and proton decay searches. For this purpose, we evaluated a new model for single pion production, called the dynamical coupled-channels model (DCC, T. Sato et al.). We compared it with the Berger-Sehgal model, currently used in the NEUT neutrino interaction generator and past experimental data sets. We also mention the implementation of electro-pion production using the same model. The results and future perspectives will be presented.

### Submitted on behalf of a Collaboration?

No

**Author:** YAMAUCHI, Koki (Department of Physics and Astronomy, Faculty of Science and Technology, Tokyo University of Science, Japan)

**Co-authors:** ISHITSUKA, Masaki (Tokyo University of Science (JP)); HAYATO, Yoshinari (Kamioka Observatory, ICRR, The University of Tokyo (JP))

**Presenter:** YAMAUCHI, Koki (Department of Physics and Astronomy, Faculty of Science and Technology, Tokyo University of Science, Japan)

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