



Contribution ID: 102

Type: **Parallel Contributed Talk**

## Probing nuclear effects in neutrino $CC1\pi^+$ interactions with transverse kinematic imbalance measurement in T2K

*Friday, 19 February 2021 10:20 (20 minutes)*

Neutrino interactions with nuclei are the main experimental tool used to study neutrinos in many different contexts, and systematic uncertainties arising from neutrino-nucleus interactions, especially those related to nuclear effects, can be a limiting factor in their energy reconstruction. For the  $CC1\pi$  interaction, which is dominated by resonant production, physics of the initial state nucleon correlations, self-energy corrections of the force mediator, and the  $\Delta$  resonance propagation inside the nucleus are not well-modelled. We present the first experimental study of nuclear medium effects in  $CC1\pi^+$  interaction by measuring the kinematic imbalance between the muon, pion and proton in the plane transverse to the incoming neutrino. The extracted cross-section as a function of the imbalance is sensitive to the nuclear physics model and final state interactions. This new measurement provides unique constraints to characterize the nuclear effects in neutrino interaction modelling.

### Collaboration name

T2K Collaboration

**Primary author:** TSUI, Ka Ming (University of Liverpool)

**Presenter:** TSUI, Ka Ming (University of Liverpool)

**Session Classification:** Cross Sections

**Track Classification:** Neutrino Masses and Mixings