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Measuring the anti-muon-neutrino induced charged-current coherent pion production using the T2K near detector

Wednesday, June 5, 2019 12:00 PM (15 minutes)

A neutrino(anti-neutrino) can interact with the target nucleus as a whole (coherent scattering, COH) and produce a pion in the final state. This process can be mediated by either a Z (neutral-current, NC) or a W boson (charged-current, CC). In both cases, produce a pion, and the target nucleus recoils intact and is generally unobservable in neutrino detectors. Thus, NC-COH is one of the main backgrounds for electron neutrino tagging in water Cherenkov detectors. Measurement of CC-COH can help to constrain the modeling of coherent pion production in neutrino event generators.

The Tokai-to-Kamioka (T2K) experiment published the first measurement of CC-COH in the sub-GeV neutrino energy region with neutrino flux of 0.6GeV energy on the carbon target. This talk will focus on the analysis of CC-COH with T2K's anti-neutrino beam and a statistical update to the neutrino CC-COH measurement. Plans for calculating a neutrino/antineutrino CC-COH ratio will also be discussed.

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