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Measurement of the Charged Current ν_e(and $\bar{\nu}_e$) Interaction Rate on Water with the T2K P0D Detector YUE WANG, State Univ of NY- Stony Brook, T2K COLLABORATION — T2K is a long baseline neutrino oscillation experiment with the primary goal of measuring neutrino oscillation parameters including CP violation phase, δ_{CP} using ν_μ disappearance and ν_e appearance from ν_μ beams. The largest irreducible background for the ν_e appearance measurement comes from intrinsic ν_e component in a ν_μ beam. While T2K uses Super-Kamiokande water Cherenkov detector as its far detector, there has been no precise measurement of ν_e interaction on water. Thus, the interaction rate of ν_e on water is constrained by the measured rate of ν_μ on carbon. Consequently, in current neutrino oscillation analysis, one of the major systematic uncertainties originates from cross-section model uncertainties for C versus for O. To measure δ_{CP}, measurements of both ν_e appearance and $\bar{\nu}_e$ appearance are needed. So, measurements of both interactions rate of ν_e and $\bar{\nu}_e$ on water are important. The design of P0D, a component of near detectors in T2K, which includes fillable water targets, allows us to measure on-water interaction rate and cross-section. I will present the measurement of the charged current ν_e interaction rate on water using P0D and a preliminary result with $\bar{\nu}_e$.

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