

Abstract Submitted
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T2K Outer Detector Events TARITREE WONGJIRAD, Duke University, T2K COLLABORATION — In the long-baseline neutrino oscillation experiment, T2K, the Super-Kamiokande (Super-K) detector is used to detect neutrino interactions from a beam 295 km away. Super-K is a 40 kTon water Cerenkov detector that is divided into two segments: a cylindrical inner volume, the Inner Detector (ID), nested inside a cylindrical outer volume, the Outer Detector (OD). Typically, the OD's role is to act as a cosmic ray veto for the ID. However, in T2K, events that involve signals in the OD can be kept for use in neutrino analyses. This is because the background event rate is highly suppressed when events are accepted within the small time window coincident with the arrival of beam neutrinos at Super-K. Also, an understanding of events outside the ID was helpful in the recent T2K result, which showed an indication of non-zero θ_{13} . The six neutrino events used in the analyses were clustered near the upstream inner detector wall. A study was made that concluded that the possible contribution of background events from outside the ID to the six signal events was small. In this talk, I will describe the techniques used to select neutrino events involving the OD, possible future analyses that use these events, and our study of background events due to interactions outside the ID.

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