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Upper bound on neutrino mass with T2K

The Tokai to Kamioka (T2K) long-baseline neutrino experiment has conclusively demonstrated the appearance of electron neutrinos in a nearly pure beam of muon neutrinos. The T2K experiment also performed precise measurements of neutrino oscillation parameters in the muon neutrino dis-appearance channel and cross-section measurements with the near detector.
The present work utilizes the T2K event time stamping capabilities at the near and far detectors to study neutrino time of flight as function of neutrino energy. The sub-GeV neutrino beam in conjunction with timing precision of order tens of ns provide sensitivity to neutrino mass in the few MeV range. We describe T2K's GPS based time stamping system and its performance as well as the data selection and analysis. Our preliminary results will be presented and placed into context of other published upper bounds on neutrino mass obtained by similar techniques.

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