## PHYSTAT-nu 2019



Contribution ID: 67

Type: not specified

## Updated Results for the Search for $\bar{\nu}_{\mu} \rightarrow \bar{\nu}_{e}$ Oscillations from T2K in the 3-flavour Framework

I report the results of a search for  $\bar{\nu}_{\mu} \rightarrow \bar{\nu}_{e}$  oscillations at the T2K experiment in a 3-flavour framework. An exposure of  $1.49 \times 10^{21}$  Protons On Target (POT) is used in  $\nu$  mode and  $1.63 \times 10^{21}$  POT in  $\bar{\nu}$  mode; an increase of 46% in the  $\bar{\nu}$  exposure compared to results reported in June 2018.

Results are reported for a joint analysis where candidate events are selected from the e-like events observed in  $\bar{\nu}$  running mode. In order to obtain the best possible constraint on  $\bar{\nu}_e$  appearance, observations from four other far detector event samples (across both  $\nu$  and  $\bar{\nu}$  modes) are used in conjunction with near-detector data. These observations constrain the values of the oscillation and systematic parameters, including the mass-hierarchy.

Two hypotheses are tested: a) no appearance and b)  $\bar{\nu}_e$  appearance according to the current best knowledge of the PMNS matrix. Both rate-only and rate+shape analyses are performed, producing p-values for each hypothesis. A description is given of the method used to constrain the parameters and the treatment of priors used to generate distributions of the rate-only and rate+shape test statistics.

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Session Classification: Welcome Reception and poster session