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Probing BSM models at future high-precision long baseline experiments

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Neutrino oscillations are a very well established phenomenon and in the last two decades we have been able to determine almost all the oscillation parameters with few percents precision.
However, there is still room for the possibility of the presence of new physics effects. In this context, long-baseline (LBL) accelerator experiments provide a great environment to probe BSM (Beyond Standard Model) models. These experiments can look at different oscillation channels at both short (near detectors) and long (far detectors) distances, working with well controlled focused neutrino beams. Two of the most promising future LBL experiments are DUNE in the USA and T2HK in Japan, which may be part of a bigger experiment (T2HKK) with a second detector in Korea. We studied the performances of these experiments in constraining different models.
For instance, we took into account the possible Non-Unitarity of the neutrino mixing matrix, searching for the best constraints on new physics parameters that DUNE and T2HKK could be able to set. Moreover, we considered how much the presence of non-standard phases may influence the δ_{CP} determination.
We also explored the capabilities of DUNE in searching for hints of the existence of Non-Standard-Interactions (NSI) in different benchmark scenarios. Regarding this, we studied the effects of vector and scalar NSI on neutrino oscillations, showing how DUNE will be able to differentiate the models.

Attendance type

In-person presentation

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