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CP-violation and non-standard neutrino interactions at long baseline experiments (15' + 2')

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We discuss the impact of non-standard neutrino matter interactions (NSI) in propagation on the determination of CP phase in the context of the long baseline accelerator experiments such as Deep Underground Neutrino Experiment (DUNE). DUNE will mainly address the issue of CP violation in the leptonic sector. Here we study the role of NSI and its impact on the question of observing the CP violation signal at DUNE. We consider two scenarios of oscillation with three active neutrinos in absence and presence of NSI. We elucidate the importance of ruling out subdominant new physics effects introduced by NSI in inferring CP violation signal at DUNE by considering NSI terms collectively as well as by exploiting the non-trivial interplay of moduli and phases of the NSI terms. We demonstrate the existence of NSI-SI degeneracies which need to be eliminated in reliable manner in order to make conclusive statements about the CP phase.

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