

Peter Denton – HEP Seminar – March 16, 2021  
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Title: CP Violation at Long-Baseline Neutrino Experiments

Abstract: The nature of CP violation in the lepton sector is one of the biggest open questions in particle physics. Long-baseline accelerator neutrino experiments have the opportunity to determine if CP is violated in the mass matrix. I will discuss some theoretical issues about how CP is parameterized and, in particular, that using  $\delta$  is misleading. Then I will look at the most recent NOvA and T2K data which show a slight and very interesting tension. While this tension possibly indicates a flipping in the mass ordering, it is better fit by new physics such as NSI with an additional source of CP violation. The strength of this NSI can be easily estimated analytically and I will present a numerical analysis of the preferred regions which are generally consistent with other constraints.