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Impact of sterile neutrinos on CP measurements at DUNE

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Long-baseline neutrino experiments aim to measure the parameters responsible for neutrino oscillations. Now that θ13 has been conclusively shown to be non-zero and not too small, the focus has shifted to the measurement of the
(Dirac) CP phase δCP that determines whether or not oscillating neutrinos violate CP. one of the main aim of the upcoming long baseline experiment DUNE is to measure this phase. But, there are evidences suggesting the possibility of the existence of one (or possibly more) more generation of neutrino (called sterile neutrino) which may have small mixings with the standard model neutrinos. These extra generation of neutrino brings in extra CP phases into play. The additional phases due to the presence of even one sterile neutrino of mass ~ 1 eV can potentially create a significant degeneracy in measuring δCP at DUNE. On the basis of our recent paper arXiv:1508.06275, I will talk about the large magnitude of these effects using probability level
analysis and neutrino-antineutrino asymmetry calculations and will also discuss about how it translates into significant event rate deviations at DUNE.

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