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Energy-dependent neutrino mixing parameters at oscillation experiments

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Neutrino mixing parameters are subject to quantum corrections and hence are scale dependent. This means that the mixing parameters associated with the production and detection of neutrinos need not coincide since these processes are characterized by different energy scales. We show that, in the presence of relatively light new physics, the scale dependence of the mixing parameters can lead to observable consequences in long-baseline neutrino oscillation experiments, such as T2K and NOvA, and in neutrino telescopes like IceCube. We discuss the experimental signatures of this scenario in detail.

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