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The effect of sterile neutrinos on long-baseline experiments

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A variety of anomalies in short-baseline neutrino experiments hint at the possible existence of light sterile neutrinos. We show that these sterile neutrinos, if real, could very substantially affect the interpretation of future long-baseline measurements, such as those of the Deep Underground Neutrino Experiment (DUNE). In particular, interpretations that do not take the sterile neutrinos into account could lead to grossly incorrect conclusions concerning leptonic CP violation. We explore the degree to which future short-baseline experiments, should they prove to be negative, need to constrain sterile-active mixing to ensure that long-baseline experiments can safely disregard the possibility that light sterile neutrinos exist.

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