Abstract Submitted
for the APR20 Meeting of
The American Physical Society

Improved Limits on Light Sterile Neutrino Mixing from Disappearance Searches at Daya Bay, MINOS/MINOS+, and Bugey-3 MATT KRAMER, UC Berkeley, DAYA BAY COLLABORATION — Reactor neutrino experiments are well-suited for probing the existence of a light sterile neutrino in the region of a sub-eV^2 mass splitting. Using eight functionally identical antineutrino detectors, the Daya Bay experiment measures the electron antineutrinos produced by six nuclear reactors located near Shenzhen, China. A 1230-day sample of antineutrinos was used to set the most stringent limits to date on the mixing of sterile neutrinos for $2 \times 10^{-4} < \Delta m^2_{41} < 0.3$ eV^2, based on two independent statistical methods, Feldman-Cousins and CL$_s$, which gave consistent results. Going further, sensitivity was extended to larger Δm^2_{41} using data from the Bugey-3 short-baseline reactor experiment and MINOS/MINOS+ accelerator experiments. The joint analysis excludes the LSND and MiniBooNE allowed regions for $\Delta m^2_{41} < 5$ (1.2) eV^2 at 90% (99%) C.L., strongly increasing the tension between a four-flavor interpretation of their observations and the null results of other experiments.

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Date submitted: 12 Jan 2020 Electronic form version 1.4