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Neutrino oscillation experiments (Reactor, atmosphere, long baseline)

Monday 25 August 2025 09:50 (30 minutes)

I will review the current status of reactor, atmospheric, and long-baseline accelerator neutrino oscillation experiments, with a focus on the parameter constraints within the three-flavor oscillation framework. Thanks to a wide range of experiments, we now have increasingly precise neutrino oscillation measurements across a broad spectrum of energies and baselines. This is significant for two reasons. First, the consistency of results across experiments —despite differences in detector technologies, neutrino sources, and interaction channels —demonstrates successful control over systematic uncertainties at current statistics. Second, while individual experiments only probe specific projections of the oscillation parameter space, leading to various degeneracies in parameter inference, the combination of results from multiple experiments helps to both lift some of these degeneracies and test the validity of the three-flavor oscillation framework. Future prospects and remaining challenges will also be discussed.

Collaboration you are representing

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