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Accelerator and reactor complementarity in coherent neutrino-nucleus scattering

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The recent detection of coherent elastic neutrino-nucleus elastic scattering ($\text{CE}\nu\text{NS}$) by the COHERENT experiment has enabled new area of neutrino physics. Apart from neutrino experiments using the stop pion source, the $\text{CE}\nu\text{NS}$ measurement may be complemented by reactor experiments. We studied this complementarity between the accelerator and reactor $\text{CE}\nu\text{NS}$ experiments for constraining new physics in the form of non-standard neutrino interactions (NSI). Previous studies that have constrained NSI with both oscillation and scattering experiments typically vary one or two NSI parameters when fitting to a given data set. In this talk, however, we consider four flavor-diagonal up and down-type NSI parameters. We demonstrated that a simultaneous analysis with reactor and accelerator experiments, for several different target materials, breaks a degeneracy between up and down flavor diagonal NSI terms that has persisted with neutrino experiments.

Summary

Authors: LIAO, Shu (Texas A&M University); DUTTA, Bhaskar (Texas A&M University); DENT, James (Sam Houston State University); NEWSTEAD, Jayden; WALKER, Joel Wesley (Texas A & M University (US)); Prof. STRIGARI, Louis (Texas A&M University)

Presenter: LIAO, Shu (Texas A&M University)

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