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Precision neutrino experiments versus the Littlest Seesaw

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We present a study into the extent that upcoming precision neutrino oscillation experiments will exclude one of the most predictive models of neutrino mass and mixing: the Littlest Seesaw. This model provides a good fit to current data, predicting eight observables from two input parameters, and provide new assessments of its predictions and their correlations. The ability to exclude this model is assessed using simulations of upcoming neutrino oscillation experiments including the medium-distance reactor experiments JUNO and RENO-50 and the long-baseline accelerator experiments DUNE and T2HK. We show that an accurate determination of the currently least well measured parameters, namely the atmospheric and solar angles and the CP phase δ, provide crucial independent tests of the model. For θ_{13} and the two mass-squared differences, however, the model's exclusion requires a combination of measurements coming from a varied experimental programme. These results show that the synergy and complementarity of future experiments will play a vital role in efficiently discriminating between predictive models of neutrino flavour, and hence, towards advancing our understanding of neutrino oscillations in the context of the flavour puzzle of the Standard Model.

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