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Impact of light sterile neutrinos on the interpretation of NOvA and T2K results

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We study in detail the impact of a light sterile neutrino on the interpretation of the recent data of the long baseline experiments NOνA and T2K, assessing the robustness/fragility of the estimates of the standard 3-flavor parameters with respect to the perturbations induced in the 3+1 scheme. We find that all the basic features of the 3-flavor analysis, including the weak indication ($\sim$1.4σ) in favor of the inverted neutrino mass ordering, the preference for values of the CP-phase $\delta_{13} \sim 1.2\pi$, and the substantial degeneracy of the two octants of θ_{23}, all remain basically unaltered in the 4-flavor scheme. Our analysis also demonstrates that it is possible to attain some constraints on the new CP-phase δ_{14}. Finally, we point out that, differently from non-standard neutrino interactions, light sterile neutrinos are not capable to alleviate the tension recently emerged between NOνA and T2K in the appearance channel.

Primary author: PALAZZO, Antonio (Istituto Nazionale di Fisica Nucleare)

Co-author: CHATTERJEE, Sabya Sachi (IPhT CEA-Saclay)

Presenter: PALAZZO, Antonio (Istituto Nazionale di Fisica Nucleare)

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