



High Energy Physics - Phenomenology

3+1 and 3+2 Sterile Neutrino Fits

Carlo Giunti, Marco Laveder

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We present the results of fits of short-baseline neutrino oscillation data in 3+1 and 3+2 neutrino mixing schemes. In spite of the presence of a tension in the interpretation of the data, 3+1 neutrino mixing is attractive for its simplicity and for the natural correspondence of one new entity (a sterile neutrino) with a new effect (short-baseline oscillations). The allowed regions in the oscillation parameter space can be tested in near-future experiments. In the framework of 3+2 neutrino mixing there is less tension in the interpretation of the data, at the price of introducing a second sterile neutrino. Moreover, the improvement of the parameter goodness of fit is mainly a statistical effect due to an increase of the number of parameters. The CP violation in short-baseline experiments allowed in 3+2 neutrino mixing can explain the positive antinu_μ → antinu_e signal and the negative nu_μ → nu_e measurement in the MiniBooNE experiment. For the CP-violating phase we obtained two minima of the marginal χ^2 close to the two values where CP-violation is maximal.

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