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Joint Constraints on Neutrino Masses from Cosmology and Particle Physics

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The absolute scale of neutrino masses is one of the main open issues both in cosmology and particle physics. Current experimental strategies involve i) measurements exploiting kinematics effects in beta decay, ii) searches for neutrinoless double beta decay ('0n2b'), and iii) cosmological observations. The three approaches are complementary, each of them presenting its own advantages and disadvantages, and also because they are sensitive to slightly different quantities related to the neutrino masses. In this work, we want to derive joint constraints on neutrino mass parameters from the most recent observations from both laboratory and cosmological experiments, and forecasts, combining them in the framework of Bayesian statistics. In particular, for '0n2b' experiments, we take into account the uncertainty related to nuclear matrix elements, in order to account its impact on the neutrino mass estimates.

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