

Cosmological radiation density with non-standard neutrino-electron interactions

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Neutrino non-standard interactions (NSI) are known to modify the picture of neutrino decoupling from the cosmic plasma. These NSI alter flavour oscillations through matter effects and the annihilation and scattering between neutrinos and electrons and positrons in the thermal plasma. In view of the forthcoming cosmological observations, we perform a precision study of the impact of non-universal and flavour-changing NSI on the effective number of neutrinos, N_{eff} . We present the variation of N_{eff} arising from the different NSI parameters and discuss the existing degeneracies among them, from cosmology alone and in relation to the current bounds from terrestrial experiments. We find that future cosmological data would provide competitive and complementary constraints for some of the couplings and their combinations.

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