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Inflation models in the light of self-interacting sterile neutrinos

SBL neutrino experiments, like LSND and MiniBooNE experiments, indicates towards the existence of eV mass sterile neutrinos. But eV mass sterile neutrinos are in tension with the cosmological observations. To accommodate sterile neutrinos in cosmology self interaction between sterile neutrinos has been studied. We analyzed Planck CMB data with self-interacting sterile neutrino (SI ν) and studied their impact on inflation models. We found that the fit to the CMB data in SI ν model is as good as that to Λ CDM model and the spectral index values shift to 0.9375 ± 0.0058 in SI ν model. We found that the Starobinsky and quartic hilltop model, which were allowed within Λ CDM cosmology, are ruled out. Whereas some models like natural and Coleman-Weinberg inflation are now favored. Therefore, the existence of self interacting sterile neutrinos with eV order of mass will play an important role in the selection of correct inflation model.

Mini-abstract

SI ν impact the choice of inflation models as n_s shifts to 0.937 in SI ν model within CMB data.

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