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Forecast on lepton asymmetry from future CMB experiments

We consider a cosmological lepton asymmetry in the form of neutrinos and impose new expected sensitivities on such asymmetry through the degeneracy parameter (ξ_ν) by using some future CMB experiment configurations, such as CORE and CMB-S4. Taking the default scenario with three neutrino states, we find $|\xi_\nu| = 0.05 \pm 0.10 (\pm 0.04)$, from CORE (CMB-S4) at 95 per cent CL, respectively. Also, within this scenario, we evaluate the neutrino mass scale, obtaining that the normal hierarchy mass scheme is privileged. Our results are an update concerning on the cosmological lepton asymmetry and the neutrino mass scale within this context, from which can bring a perspective on the null hypothesis for ξ_ν (and its effects on ΔN_{eff}), where perhaps, ξ_ν may take a non-null value up to 95 per cent CL from future experiments such as CMB-S4. Sensitivity results for CMB-S4 obtained here not including all expected systematic errors.

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