Contribution ID: **202** Type: **Parallel Talk**

Testing the properties of relic neutrinos using (CνB) the latest cosmological observational data, including a forecast based on GWs

Monday, 30 November 2026 15:00 (30 minutes)

We investigate the observational constraints on the cosmic neutrino background (CνB) given by the extended ΛCDM scenario (ΛCDM+Neff +mν +c2
eff +c2
vis+ξν) using the latest observational
data from Planck CMB (temperature power spectrum, low polarisation and lensing reconstruction), baryon acoustic oscillations (BAOs), the new recent local value of the Hubble constant from Hubble Space Telescope (HST) and information of the abundance of galaxy clusters (GCs). We study the constraints on the CνB background using CMB + BAO + HST data with and without the GC data. We find ΔNeff = 0.614 ± 0.26 at 68 % CL when the GC data are added in the analysis.
We do not find significant deviation for sound speed in the CνB rest frame. We also analyze the particular case ΛCDM + Neff + mν + ξνwith the observational data. Within this scenario, we find ΔNeff = 0.60 ± 0.28 at 68 % CL. In both the scenarios, no mean deviations are found for the degeneracy parameter. On the other hand, we consider a cosmological lepton asymmetry and Dirac Neutrinos and impose new expected sensitivities by using some future CMB experiment configurations, such as CORE and CMB-S4 and sensitivity curves of future gravitational-wave detectors such as LISA and ET telescope.

Academic position of the presenting author

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