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## Light sterile neutrinos in cosmology: current bounds and new physics scenarios

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In the last recent years different anomalies observed in short-baseline neutrino oscillation experiments seem to point towards the existence of light sterile neutrinos. These sterile neutrinos can also be produced in the early universe by oscillations of the active neutrinos and can affect different cosmological observables. In particular, their properties can be constrained by their contribution to the extra-radiation, parameterized in terms of the effective number of neutrino species  $N_{\text{eff}}$ , and to the universe energy density today  $\Omega_{\nu} h^2$ .

We present updated cosmological bounds on sterile neutrinos based on the Planck data, and on the combination with the recent BICEP-2 measurements of CMB polarization.

We find a tension between the cosmological data and the short-baseline hints of light sterile neutrinos.

Finally, we discuss two mechanisms proposed to relieve this tension, suppressing the relic sterile neutrino abundance, namely large primordial neutrino asymmetries and secret interactions in the sterile neutrino sector. We will also present the possible signatures of these mechanisms on BBN.

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