

Neutrino asymmetry in a hot plasma of early Universe

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The neutrino asymmetry can be generated due to the Berry curvature in the momentum space that modifies the known Boltzmann equations for neutrinos and antineutrinos interacting with plasma in Standard Model both before and after electroweak phase transition in early Universe.

If magnetic fields are unstable due to neutrino asymmetry one can put a lower bound on that asymmetry in agreement with the known (Dolgov et al. 2002) upper (BBN) bound $\xi_{\nu_e} \leq 0.07$ for electron neutrinos.

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