

Baryogenesis and leptogenesis under minimal extension beyond the standard model.

In this study, we explore the formalisms of quantum field theory to understand the matter-antimatter asymmetry in a new physics scenario. According to the Sakharov conditions, we focus on CP symmetry violation and out-of-equilibrium dynamics.

In particular, we show the relevance of the one-loop radiative corrections in generating a net baryon number. To exemplify this mechanism, we study a simple model that explains baryogenesis and leptogenesis in the early universe by introducing a heavy scalar boson. Finally, we adjust the model parameters to satisfy the experimental and cosmological constraints.

As a supplement, we also review the Boltzmann equation formalism in a very comprehensive way.

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