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Production of baryon asymmetry and relic gravitational waves by random hypermagnetic fields

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We study the generation of the baryon asymmetry of the universe (BAU) and relic gravitational waves (GWs) in turbulent hypermagnetic fields (HMFs) in the symmetric phase of the early universe before the electroweak phase transition (EWPT). The noise of HMFs is modeled by the analog of the magnetic hydrodynamics turbulence. The evolution of HMFs is driven the analogs the chiral magnetic effect and the Adler anomalies in the presence of the nonzero asymmetries of leptons and Higgs bosons. We track the evolution of BAU and the energy density of GWs from $T = 10$ TeV down to EWPT and analyze their dependence on the parameters of the system. We also discuss the possibility to observe the predicted GW background by the current GW detectors.

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