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Moduli-induced Baryogenesis

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We study a scenario for baryogenesis in modular cosmology and discuss its implications for the moduli stabilization mechanism and the supersymmetry (SUSY) breaking scale. If moduli fields dominate the Universe and decay into the standard model particles through diatonic couplings, the right amount of baryon asymmetry can be generated through CP violating decay of gluino into quark and squark followed by baryon-number violating squark decay. We find that, in the KKLT-type moduli stabilization, at least two non-perturbative terms are required to obtain a sizable CP phase, and that the successful baryogenesis is possible for the soft SUSY breaking mass heavier than O(1) TeV. A part of the parameter space for successful baryogenesis can be probed at the collider experiments, dinucleon decay search experiment, and the measurements of electric dipole moments of neutron and electron. It is also shown that similar baryogenesis works in the case of the gravitino- or the saxion-dominated Universe.

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