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All-in-one relaxion

We show that spontaneous baryogenesis can occur almost automatically in relaxion models. During the slow roll, the relaxion breaks CPT, biasing the thermal equilibrium in favour of baryons, with sphalerons providing the necessary baryon number violation. We show how this CPT violation can be communicated to the SM baryons by coupling the relaxion to a RH neutrino current that arises naturally from a neutrino mass model. The mechanism operates precisely in the region of parameter space where recent work has shown relaxion oscillations to be a dark matter candidate. In the end, with a minimal modification of the original relaxion set-up, we obtain a unified relaxion solution to the five major outstanding issues in particle physics: the hierarchy problem, dark matter, matter-antimatter asymmetry, neutrino masses and the strong CP problem.

Presentation type

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