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## Baryogenesis in a Parity Solution to the Strong CP Problem

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Space-time parity can solve the strong CP problem and introduces a spontaneously broken  $SU(2)_R$  gauge symmetry. We investigate the possibility of baryogenesis from a first-order  $SU(2)_R$  phase transition similar to electroweak baryogenesis. We consider a model with the minimal Higgs content, for which the strong CP problem is indeed solved without introducing extra symmetry beyond parity. Although the parity symmetry seems to forbid the  $SU(2)_R$  anomaly of the  $B-L$  symmetry, the structure of the fermion masses can allow for the  $SU(2)_R$  sphaleron process to produce non-zero  $B-L$  asymmetry of Standard Model particles so that the wash out by the  $SU(2)_L$  sphaleron process is avoided. The setup predicts a new hyper-charged fermion whose mass is correlated with the  $SU(2)_R$  symmetry breaking scale and hence with the  $SU(2)_R$  gauge boson mass, and depending on the origin of CP violation, with an electron electric dipole moment. In a setup where CP violation and the first-order phase transition are assisted by a singlet scalar field, the singlet can be searched for at future colliders.

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