

Leptogenesis from a Phase Transition in a Dynamical Vacuum

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We show that a phase transition may take place in the early Universe at a temperature T_* resulting a temperature dependent mass for right handed neutrinos (RHN) which finally relaxes to a constant value after electroweak symmetry breaking (EWSB). As a result, a requisite amount of lepton asymmetry can be produced near T_* satisfying the observed baryon asymmetry of the Universe via sphaleron process even when zero temperature masses of the RHNs fall below the electroweak scale enhancing the detection possibility of RHNs. Interestingly, the framework is also capable of predicting a primordial lepton asymmetry (generated after EWSB) as hinted by helium abundance measurements, indicating a correlation with early phase of leptogenesis.

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