

Dynamical Generation of the Baryon Asymmetry from a Scale Hierarchy

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Abstract: We propose a novel baryogenesis scenario where the baryon asymmetry originates directly from a hierarchy between two fundamental mass scales: the electroweak scale and the Planck scale. Our model is based on the neutrino-portal Affleck-Dine (AD) mechanism, which generates the asymmetry of the AD sector during the radiation-dominated era and subsequently transfers it to the baryon number before the electroweak phase transition. The observed baryon asymmetry is then a natural outcome of this scenario. The model is testable as it predicts the existence of a Majoron with a keV mass and an electroweak scale decay constant. The impact of the relic Majoron on ΔN_{eff} can be measured through near-future CMB observations.

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