



Contribution ID: 50

Type: **Parallel talks**

Revisiting Affleck-Dine Leptogenesis with light sleptons

Monday 17 July 2023 18:20 (20 minutes)

We revisit the Affleck-Dine leptogenesis via the LH_u flat direction with a light slepton field. Although the light slepton field is favored in low-energy SUSY phenomenologies, such as the muon $g - 2$ anomaly and bino-slepton coannihilation, it may cause a problem in the Affleck-Dine leptogenesis: it may create an unwanted charge-breaking vacuum in the Affleck-Dine field potential so that the Affleck-Dine field is trapped during the course of leptogenesis. We investigate the conditions under which such an unwanted vacuum exists and clarify that both thermal and quantum corrections are important for the (temporal) disappearance of the charge-breaking minimum. We also confirm that if the charge-breaking vacuum disappears due to the thermal or quantum correction, the correct baryon asymmetry can be produced while avoiding the cosmological gravitino problem.

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Session Classification: Particle cosmology: Theory and Experiment

Track Classification: Particle cosmology: Theory and Experiment