

Phenomenology: Ultraviolet Sensitivity of Peccei–Quinn Inflation

Tuesday, September 5, 2023 3:15 PM (15 minutes)

The radial direction of the Peccei–Quinn field can drive cosmic inflation, given a non-minimal coupling to gravity. This scenario has been considered to simultaneously explain inflation, the strong CP problem, and dark matter. We argue that Peccei–Quinn inflation is extremely sensitive to higher-dimensional operators. Further combining with the discussion on the axion quality required for solving the strong CP problem, we examine the validity of this scenario. We also show that after Peccei–Quinn inflation, resonant amplifications of the field fluctuation is inevitably triggered.

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Session Classification: Parallel Sessions