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Probing Inflationary Reheating via Axion Experiments

Thursday 25 April 2024 15:30 (15 minutes)

In this talk, we will explore the phenomenological implications for axion dark matter production via misalignment during inflationary reheating. We investigate scenarios involving inflaton oscillating in a generic potential $\sim \phi^n$, considering inflaton decay and annihilation for reheating. For low reheating temperatures, the parameter space leading to the correct relic abundance can be enlarged beyond the standard case. Depending on the type of inflaton-matter couplings and the value of n, we find that certain parts of the extended parameter space are already constrained by ADMX, CAPP, and MUSE experiments. Future Haloscope experiments are expected to impose more stringent constraints. We highlight the potential to utilize axion experiments in constraining the dynamics of reheating.

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