

No Warm Inflation From a Vanilla Axion

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At finite temperature, the coupling of an axion to non-Abelian gauge fields causes dissipation due to sphaleron heating. This mechanism is ideally suited for realizing warm inflation since it can lead to large thermal friction while preserving the flatness of the potential. We show, however, that requiring standard properties of an axion – in particular a discrete shift symmetry and a potential generated non-perturbatively by instanton effects – excludes the strong regime of warm slow-roll inflation, in which thermal friction dominates. The derivation of this result does not require any phenomenological input. While non-minimal (axion-like) models provide a way out, the present argument also leaves room for the weak regime of warm axion inflation, albeit in the latter case a super-Planckian decay constant represents a well-known issue.

Based on:

S. Zell, No Warm Inflation From Sphaleron Heating With a Vanilla Axion, arXiv:2408.07746.

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