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Effects of Reheating on Moduli Stabilization

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Moduli potential loses its minima due to external energy sources of inflaton energy density or radiation produced at the end of inflation. But, the non-existence of minima does not necessarily mean destabilization of moduli. In fact, the destabilization of moduli is always dependent on the initial field values of the fields. In this work, we study carefully how the effects of reheating ease the problem of moduli destabilization. The associated time scale to produce the thermal bath allows a larger initial field range to stabilize the field. Contrary to the usual notion, the allowed initial field range is larger for higher temperatures when the effective potential is of a run-away nature. This eases the moduli destabilization problem for heavy mass moduli. For low mass moduli (⊠ 30 TeV), the allowed field range still causes the cosmological moduli problem by violating the BBN constraints unless its initial abundance is suppressed.

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