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Bremsstrahlung-induced Gravitational Waves in Monomial Potentials during Reheating

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We discuss the production of primordial gravitational waves (GW) from radiative inflaton decay during the period of reheating, assuming perturbative decay of the inflaton either into a pair of bosons or fermions, leading to successful reheating satisfying constraint from Big Bang nucleosynthesis. Assuming that the inflaton ϕ oscillates in a general monomial potential $V(\phi) \propto \phi^n$, which results in a time-dependent inflaton decay width, we show that the resulting stochastic GW background can have optimistic detection prospects, especially in detectors that search for a high-frequency GW spectrum, depending on the choice of n that determines the shape of the potential during reheating. We also discuss how this GW energy density may affect the measurement of ΔNeff for bosonic and fermionic reheating scenarios.

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