Poster Session #C
Gravity theories

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(P)reheating Effects of a Constrained Kähler Moduli Inflation

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Inflation has been one of the most important paradigms in modern cosmology, while investigating dark energy's nature remains one of its main challenges. We study the predictions of the string-theory-motivated Kähler Moduli Inflation I (KMII) potential coupled to a light scalar field with its minimum constrained to provide a source for today's dark energy density. We use Floquet analysis and numerical lattice simulations to analyze the observable effects of the model's (p)reheating phase. We specifically focus on the phenomena of tachyonic instability and resonant reheating effects during the inflaton field oscillations. The model is consistent with the measured Cosmic Microwave Background data when the KMII potential's minimum is constrained to a value equivalent to the cosmological constant; however, it suffers from fine-tuning and predicts a high reheating temperature, which we use to obtain bounds on the inflaton field's mass. We do not observe any tachyonic instability or resonance effects in either our Floquet analysis or lattice simulation results. Finally, we compute stochastic gravitational-wave backgrounds generated during the inflaton field oscillations that would be observable today in the $10^9 - 10^{10}$ Hz frequency range.