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Nonlinear Dynamics of Preheating after Multifield Inflation with Nonminimal Couplings

Monday 2 September 2019 15:40 (15 minutes)

I will discuss the post-inflation dynamics of multi-field models involving nonminimal couplings. In particular I will describe the results of lattice simulations used to capture significant nonlinear effects like backreaction and rescattering. I will show how we can we extract the effective equation of state and typical time-scales for the onset of thermalization, quantities that could affect the usual mapping between predictions for primordial perturbation spectra and measurements of anisotropies in the cosmic microwave background radiation. For large values of the nonminimal coupling constants, efficient particle production gives rise to nearly instantaneous preheating. Moreover, the strong single-field attractor behavior that was identified for these models in linearized analyses remains robust in the full theory, and in all cases considered the attractor persists until the end of preheating. The persistence of the single-field attractor is significant because it suppresses typical signatures of multifield models. I will therefore show that even taking into account the violent preheating phase after inflation, predictions for primordial observables in this class of models retain a close match to the latest observations.

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