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Energy distribution and equation of state during and after tachyonic preheating

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We discuss the evolution of the energy distribution and equation of state during the reheating phase. We consider observationally consistent single-field inflation models, with potentials that have monomial shape around the origin and a reheating sector that comprises a massless scalar field, which couples via a trilinear interaction to the inflaton. By investigating the non-linear dynamics of these systems with the help of lattice simulations, we are able to trace back the evolution of the fields during the early preheating stage, and eventually reconstruct the whole phase of reheating. This allows us to determine the exact number of e-folds that are required to reheat the universe, such that we can reduce the uncertainty of the predictions of the spectral tilt and tensor-to-scalar ratio substantially.

Author: MARSCHALL, Kenneth

Presenter: MARSCHALL, Kenneth

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