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Energy distribution and equation of state of the early Universe after inflation

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We discuss the energy distribution and equation of state of the universe between the end of inflation and the onset of radiation domination for observationally consistent single-field inflation scenarios, with a potential 'flattening'at large field values and a monomial shape around the origin. As a proxy for (p)reheating, the inflaton is coupled to a light scalar field with a quadratic interaction and we investigate the non-perturbative and non-linear dynamics of this system with the help of lattice simulations. For particular cases we are able to calculate the exact number of e-folds until radiation domination, which significantly reduces the uncertainty in the inflationary observables, the spectral tilt and tensor-to-scalar ratio.

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