Exploring Hidden Regimes during Preheating with Effective Field Theory Methods

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Preheating refers to the stage at the end of inflation where the inflaton continues to dominate the energy momentum density but can transfer its energy to other fields through resonance. A general look at possible interactions between the inflaton and reheating perturbations with effective field theory (EFT) methods reveals that there can be three different types of kinetic coupling between the two sectors. Two of these couplings define scales below which only one of the species propagates as the effective degree of freedom. These are the Hidden Regimes, where one field implicitly works to modify the dispersion relation of the other. Within these Hidden Regimes, the effective modes are identified and their dispersion relations presented in this work.