

Preheating, Primordial Black holes, and Gravitational waves

We study the spectrum of the energy density of gravitational waves produced during the preheating phase, at the end of inflation inhomogeneities of the time-dependent field act as a source of gravitational, and the spectrum of GWs can be linked directly to the duration of preheating. Moreover, the amplification of field fluctuations during the preheating process can lead to the amplification of sufficiently large curvature perturbations which lead to the overproduction of primordial black holes (PBHs). In our work, we study PBH and GWs production from preheating. We show that gravitational wave generation during preheating can be constrained from Planck's data, and PBHs that are overpopulated during the radiation-dominated era are affected by the preheating e-folds number.

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