

Gravitational Wave Signatures of Reheating

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We initiate a study of the gravitational wave signatures of a phase transition that occurs as the Universe's temperature increases during reheating. The gravitational wave signatures of a heating phase transition are different from those of a cooling phase transition and observation of them would allow us to probe reheating. In the lucky case that the gravitational wave signatures from both the heating and cooling phase transitions were observed, information about reheating could in principle be obtained utilizing the correlations between the two transitions. Frictional effects leading to a constant bubble wall speed in one case will instead accelerate the bubble wall, often into a runaway, in the other case. The efficiencies, strength of the phase transition and duration of the phase transitions will be similarly correlated in a reheating dependent manner.

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