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Induced gravitational waves from inflaton oscillons and solitons

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We present a new way to study cosmic inflation with gravitational waves (GWs). The gravitational signal is generated thanks to nonlinear structures in the inflaton field, called oscillons. This novel probe allows us to test models of inflation which are challenging to constrain with CMB experiments. We also present a novel induced-GW signature, called Universal GWs, associated with all early-Universe scenarios involving the formation of non-inflaton solitons. Universal GWs provide a new avenue for testing the physics of primordial solitons, such as their formation and interactions, and also an explanation of the Pulsar Timing Array data.

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