

Messengers of the very early universe: Gravitational Waves and Primordial Black Holes



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Signatures of Primordial Gravitational Waves on the Large-Scale Structure of the Universe

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Primordial scalar perturbations are always considered as a source in the study of large-scale structures. Being the dominant ones at first order in perturbation theory, they have also encouraged the study of generation of second order gravitational waves from them. We seek to investigate the opposite effect, i.e. if gravitational waves can have an observable contribution on the matter power spectrum in the second order. For this, we consider gravitational waves with broken scale-invariance, which happens in some models of inflation. Our results are positive about having a significant effect, and we notice a crucial characteristic of this new effect, unlike the standard matter perturbation, it does not exist outside the horizon scales, although on smaller scales it can be said that it mimics the linear one.

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