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Primordial black holes and Gravitational waves from inflationary models based on supergravity.

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We study models of cosmic inflation in order to explain the production of primordial black holes (PBHs), which can amount of a significant fraction of dark matter (DM) in the universe and the induced gravitational waves (GWs). In particular, we present mechanisms which lead to an enhancement of the scalar power spectrum at small scales. This amplification can explain the generation of PBHs and GWs at the radiation dominated era because of the previous epoch of inflation.

The models which we present are based on supergravity theories. Specifically, in the first mechanism we present models, where their potential has an inflection point. These models are based on no-scale theory. Secondly, we refer a model based on alpha-attractors and the corresponding mechanism of the enhancement is sharp features in the potentials. Finally, we present a hybrid model with a waterfall trajectory which can lead to a significant enhancement of scalar power spectrum. In the last mechanism we have imposed supergravity corrections. All models presented are in complete consistent with the constraints of inflation given by the Planck collaboration.

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