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Cosmological Imprints of sgoldstinoless models of non-oscillatory inflation

Using effective operators, we propose models in which the sgoldstino is stabilized close to the origin to reproduce the nilpotent constraint. We show that small sgoldstino fluctuations may lead to a sizeable backreaction on the cosmological history. We study the effect of this back-reaction on the inflation observables measured in the cosmic microwave background and confront the model to a series of constraints. We show that the peculiar form of the potential in the large supersymmetry breaking scale limit can generate peaks in the scalar power spectrum produced from inflation. We study how certain perturbation modes may re-enter the horizon during or after kination and show that a large supersymmetry breaking scale may lead to the formation of primordial black holes with various masses in the early Universe.

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