High Energy Physics - Theory

Minimal Inflation

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Using the universal X superfield that measures in the UV the violation of conformal invariance we build up a model of multifield inflation. The underlying dynamics is the one controlling the natural flow of this field in the IR to the Goldstino superfield once SUSY is broken. We show that flat directions satisfying the slow roll conditions exist only if R-symmetry is broken. Naturalness of our model leads to scales of SUSY breaking of the order of 10^{11-13} Gev, a nearly scale-invariant spectrum of the initial perturbations and negligible gravitational waves. We obtain that the inflaton field is lighter than the gravitino by an amount determined by the slow roll parameter eta. The existence of slow-roll conditions is directly linked to the values of supersymmetry and R-symmetry breaking scales. We make cosmological predictions of our model and compare them to current data.

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