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Mu-term Hybrid Inflation with Low Energy Consequences

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We explore the implications of a new minimal supersymmetric hybrid inflation model in which the MSSM μ term arises from a coupling of the Higgs doublets to the inflaton sector, with |μ| required to be greater than the gravitino mass m_G. Successful inflation with the scalar spectral index ns = 0.96–0.97, is followed by a relatively high reheat temperature, T_RH ⊠ 10ˆ12 GeV, in the presence of this new coupling. Consistency with big bang nucleosynthesis favors m_G ≥ 5 × 10ˆ7 GeV, so that the gravitino decays before the LSP neutralino freezes out. With μ ~ m_G ~ 5 × 10ˆ7 GeV, and soft scalar masses of the same order, the correct value for the SM-like Higgs boson is realized for tanβ ~ 1.7. An LSP wino with mass ~ 2 TeV turns out to be the simplest dark matter candidate. The tensor to scalar ratio r, a canonical measure of gravity waves, can approach 0.001 in some cases.

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