

Realistic Brane-Antibrane Inflation

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We study in detail and generalise a recent formulation of brane-antibrane inflation in which the problems of the original formulations are addressed: separation between branes larger than the size of the extra dimension, lack of modulus stabilisation, the eta problem, and the reduction of the set-up to the unrealistic inflection point inflation. We explicitly compute the effect of brane antibrane attraction in a supersymmetric way in terms of general nilpotent superfield interactions and include perturbative moduli stabilisation. We determine the region of parameter space in which realistic slow-roll inflation is allowed as well as late-time modulus stabilisation with the volume hierarchically larger than its value during inflation. The inflationary region corresponds to the standard Coulomb attraction potential with a realistic value of the spectral index and a very small tensor-to-scalar ratio. The parameter space determined by imposing a series of consistency conditions to have control on the approximations and experimental constraints is large enough indicating that inflation happens naturally in this scenario.

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