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Observable Gravitational Waves from Higgs Inflation in SUGRA

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Abstract content

We consider models of chaotic inflation driven by the real parts of a conjugate pair of Higgs superfields involved in the spontaneous breaking of a grand unification symmetry at a scale assuming its Supersymmetric value. Employing Kaehler potentials with a prominent shift-symmetric part proportional to c^- and a tiny violation, proportional to c^+ , included in a logarithm we show that the inflationary observables provide an excellent match to the recent Planck and Bicep2/Keck Array results setting, e.g., $0.012 \leq c^+/c^- \leq 1/N$ where $N=2$ or 3 is the prefactor of the logarithm. Deviations of these prefactors from their integer values above are also explored and a region where hilltop inflation occurs is localized. Moreover, we analyze several possible stabilization mechanisms for the non-inflaton accompanying superfield using just quadratic terms. In all cases, inflation can be attained for subplanckian inflaton values with the corresponding effective theories retaining the perturbative unitarity up to the Planck scale.

Experimental Collaboration

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