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Connecting Inflation and Low Energy Phenomenology in an Extended Two-Higgs-Doublet-Model

Wednesday 23 August 2023 09:50 (20 minutes)

The Two-Higgs-Doublet-Standard Model-Axion-Seesaw-Higgs-Portal inflation (2hdSMASH) model consisting of Two Higgs doublets, a Standard Model (SM) singlet complex scalar and three SM singlet right-handed neutrinos can embed axion dark matter, neutrino masses and address inflation. We report on an investigation of the inflationary aspects of 2hdSMASH and its subsequent impact on low energy phenomenology. In particular, we identify inflationary directions for which the parameter values required for successful inflation do not violate perturbative unitarity and boundedness-from-below conditions. By analyzing the renormalization-group flow of the parameters we identify the necessary and sufficient constraints for running all parameters perturbatively and maintaining stability from the electroweak to the PLANCK scale. We determine typical benchmark points satisfying theoretical and experimental constraints which can be potentially probed by future colliders.

Collaboration / Activity

Theory

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