

Abstract Submitted
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Dynamics of the Higgs Boson as the Inflaton Field PATRICK ADAMS, DANIEL GRIN, Haverford College — We examined the minimally and non-minimally coupled models of Higgs Inflation, in hopes to constrain the behavior of both physical models. Past work has ruled out minimally coupled Higgs inflation due to inconsistent predictions for the Higgs self-interaction constraint. Though, it remains unknown if Higgs inflation is the true engine of inflation. We derived and solved for the scalar field equations of motion for both models on both a linear and re-normalized time scale. This allowed us to model the scalar field dynamics for both models in terms of the amount of e-folding during inflation. Our numerical analysis tested how varying initial conditions of the scalar field yield different values of e-folding at which inflation ends. We showed that a theory that is similar to the Old Higgs model is not alone constrained by the cosmological requirement that $N \geq 50$. Additionally, we solved for the dynamics of the non-minimally coupled Higgs Inflation model.

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