

# Dynamical Solution to the Eta Problem in Spectator Field Models

*Saturday 8 November 2025 17:00 (15 minutes)*

We study a class of spectator field models that addresses the eta problem while providing a natural explanation for the observed slight deviation of the spectrum of curvature perturbations from scale-invariance. In particular, we analyze the effects of quantum corrections on the quadratic potential of the spectator field given by its gravitational coupling to the Ricci scalar and the inflaton energy, so-called the Hubble-induced mass term. These quantum corrections create a minimum around which the potential is flatter and to which the spectator field is attracted. We demonstrate that this attractor dynamics can naturally generate the observed slightly red-tilted spectrum of curvature perturbations. Furthermore, focusing on a curvaton model with a quadratic vacuum potential, we compute the primordial non-Gaussianity parameter  $f_{\text{NL}}$  and derive a predictive relationship between  $f_{\text{NL}}$  and the running of the scalar spectral index. This relationship serves as a testable signature of the model. Finally, we extend the idea to a broader class of models where the spectator field is an angular component of a complex scalar field.

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