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## Modified Hybrid Inflation, Reheating and Stabilization of the Electroweak Vacuum

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We propose a modification to the standard hybrid inflation model, that connects a successful hybrid inflation scenario to the standard model Higgs sector, via the electroweak vacuum stability. The proposed model results in an effective inflation potential of a hilltop-type, with both the trans-Planckian and sub-Planckian inflation regimes are consistent with the recent Planck/BICEP combined results. Reheating via the inflation sector decays to right-handed neutrinos is considered. We show that the couplings of the SM Higgs to the inflation sector can guarantee the electroweak vacuum stability up to Planck scale. The so-called hybrid Higgs-inflaton model leads to a positive correction for the Higgs quartic coupling at a threshold scale, which is shown to have a very significant effect in stabilizing the electroweak vacuum. We find that even with  $O(1)$  neutrino Yukawa couplings, threshold corrections leave the SM vacuum stability intact.

**Author:** IBRAHIM, Merna (Ain Shams University/University of Cologne)

**Presenter:** IBRAHIM, Merna (Ain Shams University/University of Cologne)