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Sub-Leading Effects and the Field Range in Axion Inflation ($15' + 5'$)

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An attractive candidate for the inflaton is an axion slowly rolling down a flat potential protected by a perturbative shift symmetry. Realisations of this idea however are difficult to embed in string theory. I will show that subleading, but significant non-perturbative corrections to the axion potential can superimpose sharp cliffs and gentle plateaus into the potential, whose overall effect is to enhance the number of e-folds of inflation. Sufficient inflation is therefore achieved for smaller field ranges compared to the potential without such corrections. Thus, both single-field chaotic and natural inflation in UV complete theories like string theory, can be restored into the favoured region of current observations with distinctive signatures. Tensor modes result un-observably small, but there is a large negative running of the spectral index. Remarkably, natural inflation can be achieved with sub-Planckian axion decay constants.

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