On Model Dependence in (String) Inflation

Retooling Inflationary Attractor Dynamics

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After Planck

Hundreds of **noncanonical scalar fields** in **complicated** potentials.

Measurements **shape** and **size** of nongaussianity **offered** a **wealth** of new theoretical understanding

so... **now what?**

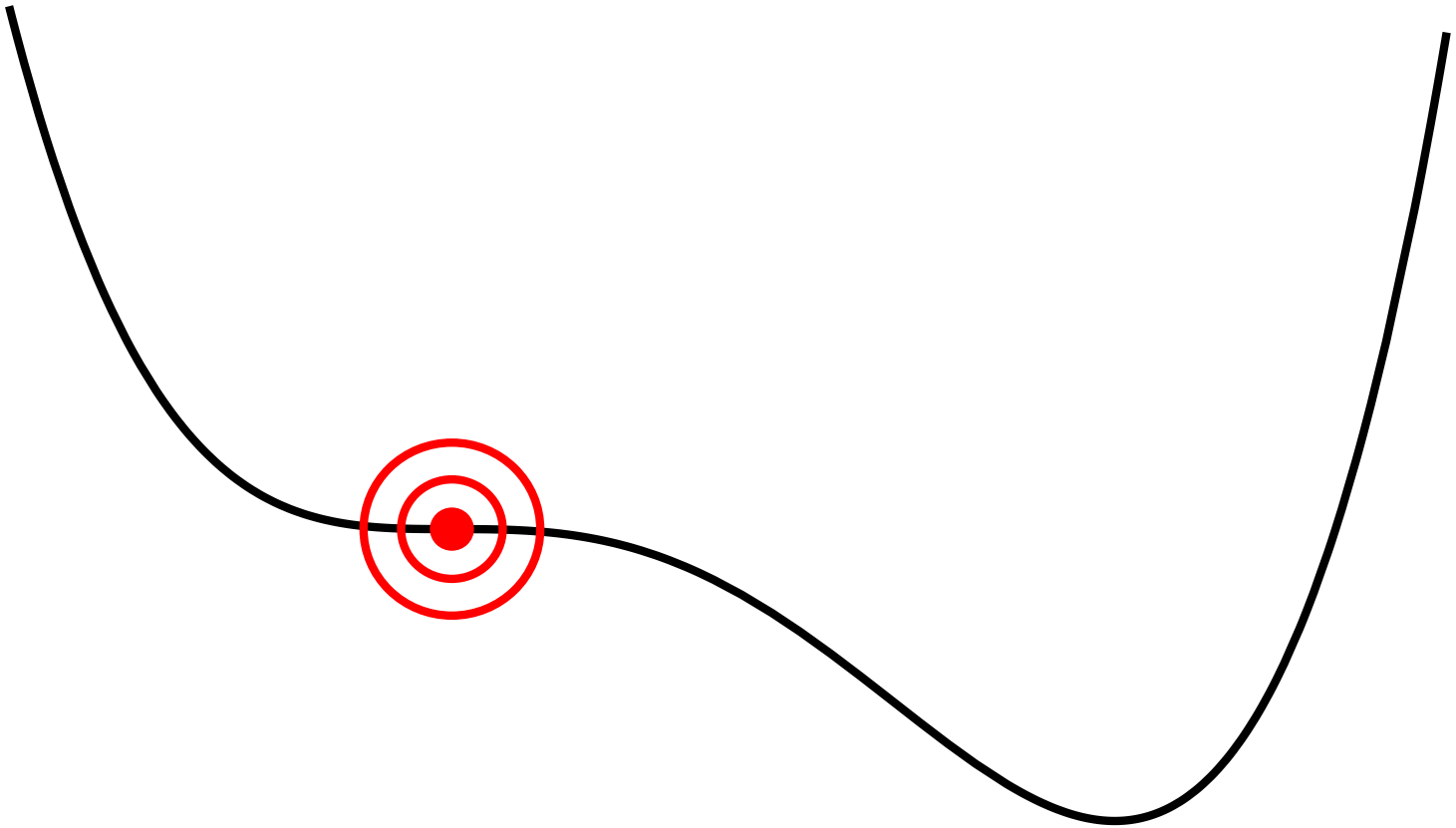
Random Supergravity Searches

Randomized **couplings** in Scalar Potential
(Bean,McAllister 11),(Frazer,Liddle 12)

"Universal" behavior, $\mathcal{P} \propto 1/N_e^3$

This scaling was related to the **emergence**...

...of an **inflection point** (SD,Dutta,Sinha 12)



Inflection Point Inflation

The Itzhaki-Kovetz Model

(Itzhaki,Kovetz 08)

$$V = 1 + \beta\phi^3$$

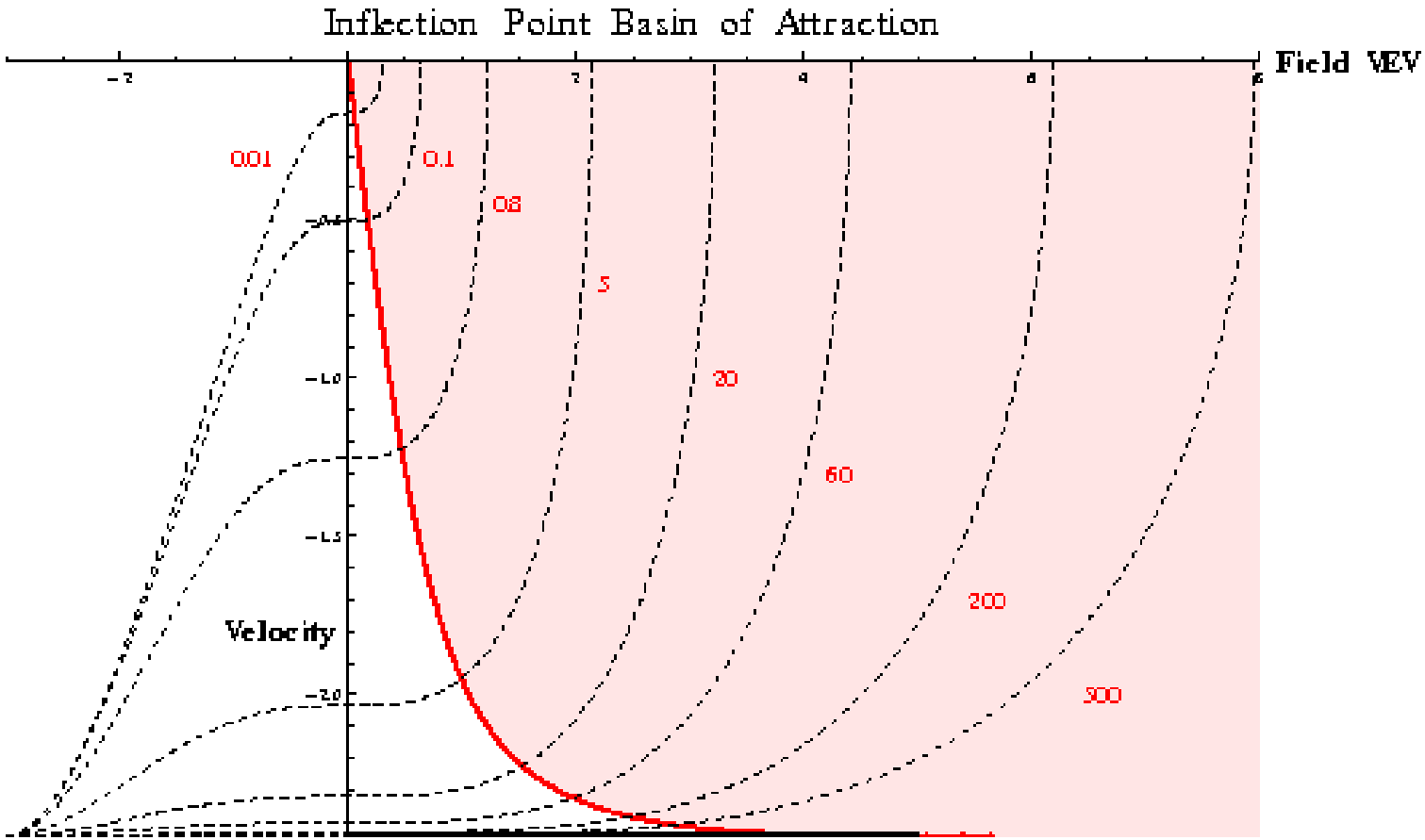
$\beta_C \approx 0.774$

overshoots when $\beta > \beta_C$

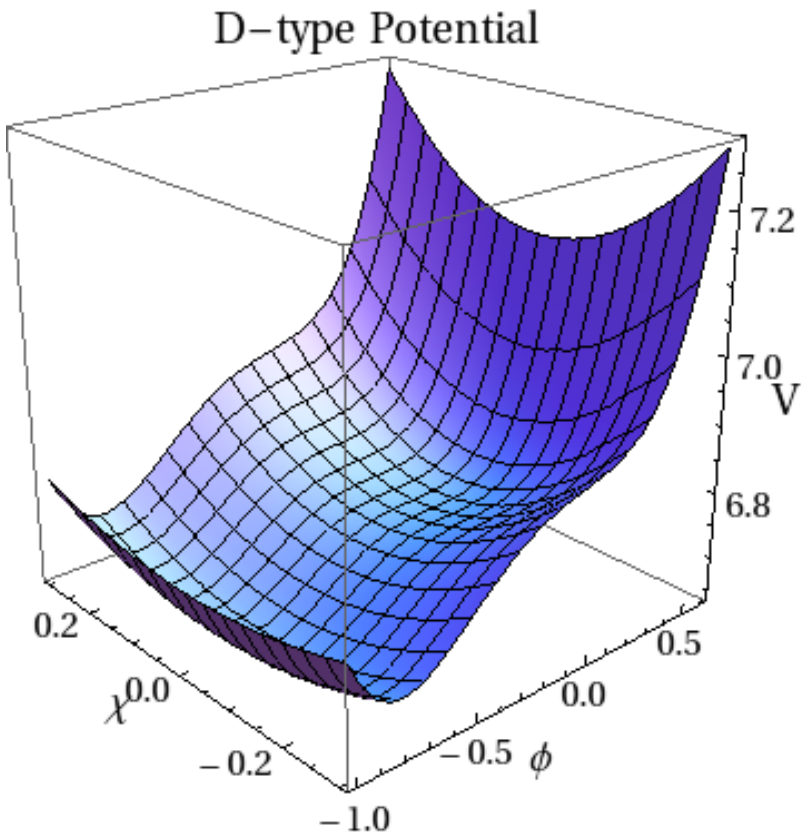
... akin to a **second order phase transition** at β_C.

The Single Field Basin of Attraction

(SD,Dutta,Sinha 12)



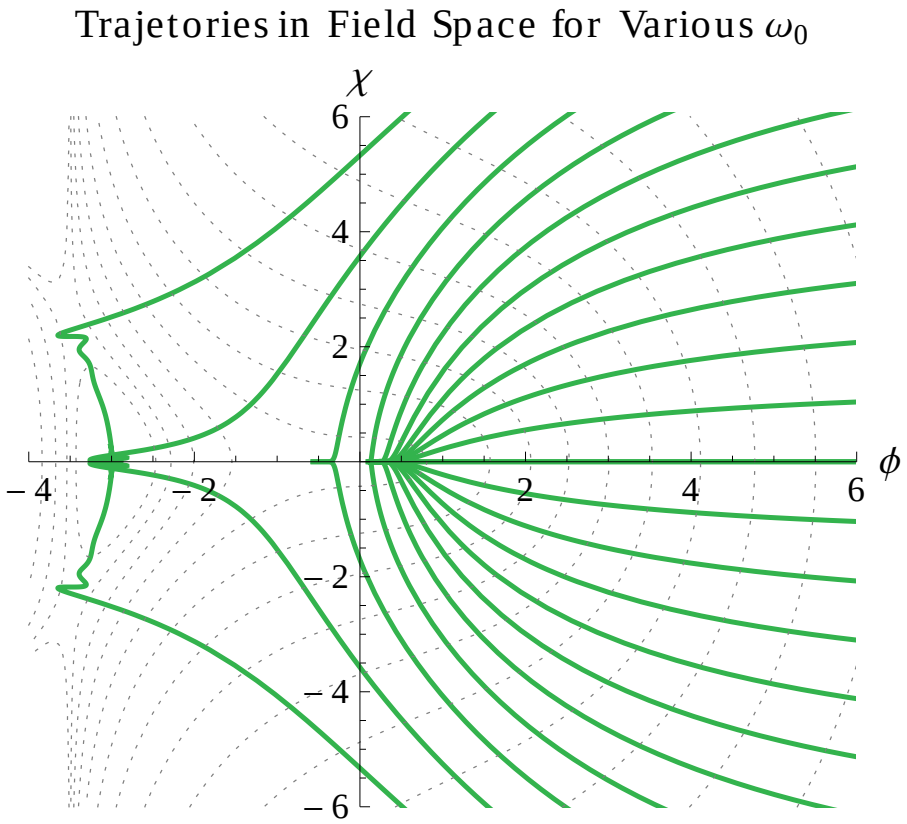
Multifield Effects



$$V = \phi^4 + \alpha\phi^3 + \beta\phi\chi^2 + m^2\chi^2 + \cdots$$

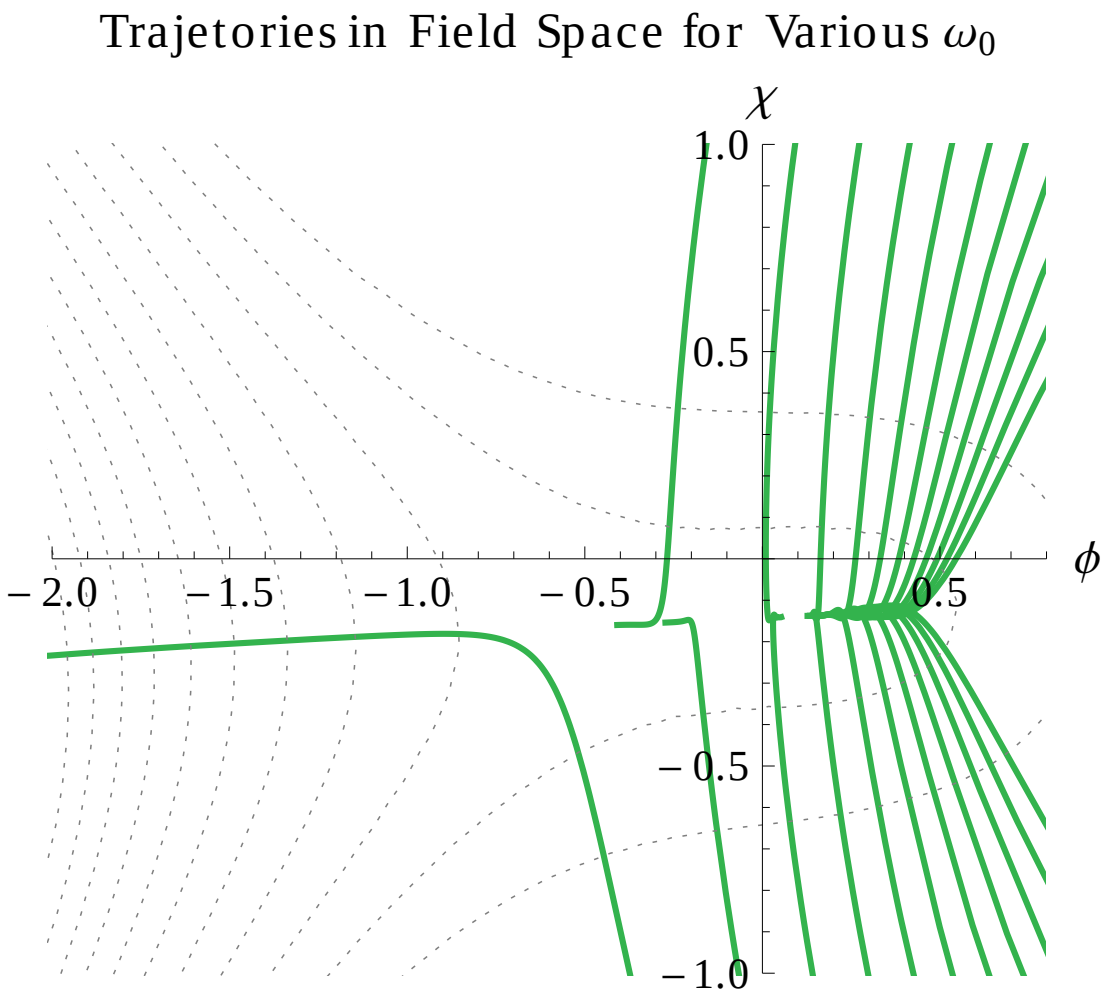
Multifield Effects

(SD,Dutta I.P.)



Multifield Effects

(SD,Dutta I.P.)



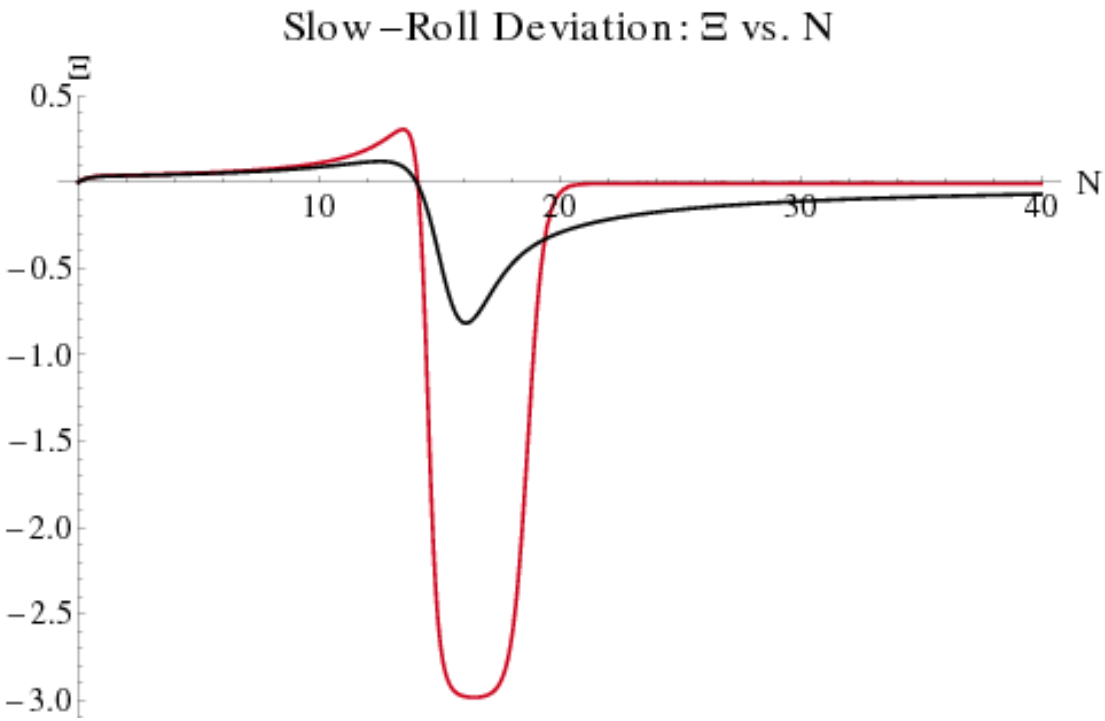
Curious Corollary

(SD,Dutta 13)

$$\frac{\partial \log \frac{\partial \phi}{\partial N}}{\partial N} \longleftrightarrow \frac{V_{\phi\phi}}{V} - \left(\frac{V_\phi}{V}\right)^2$$

Power suppression at Large Scales

(SD,Dutta 13)



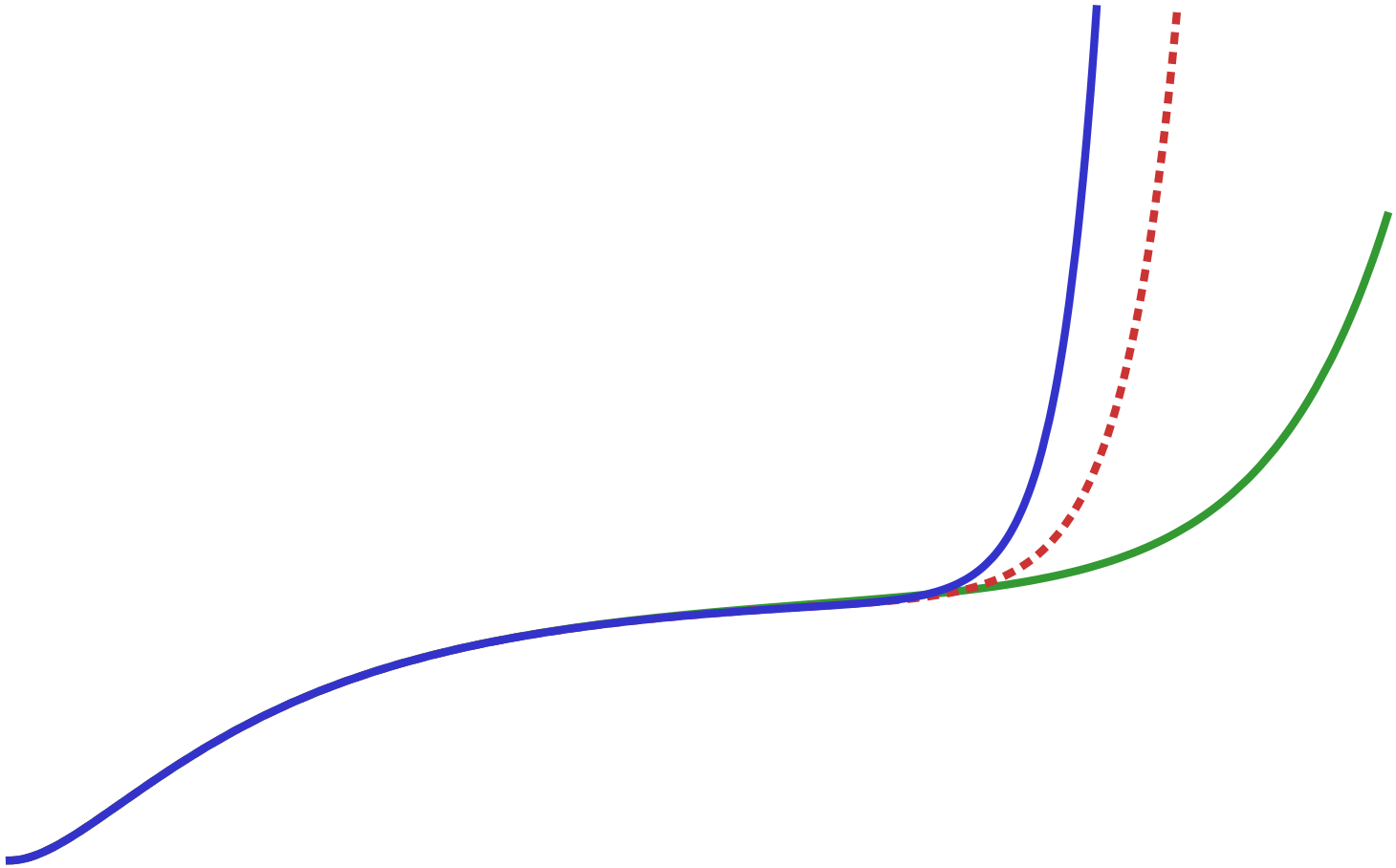
$$\frac{\partial}{\partial N}\log\frac{\partial\phi}{\partial N} \longleftrightarrow \frac{V_{\phi\phi}}{V} - \left(\frac{V_\phi}{V}\right)^2$$

On the **Attractor Dynamics** of Inflection Point Inflation:

(1) No Overshoot Problem

(2) **Dynamically generated** period of "fast-roll"

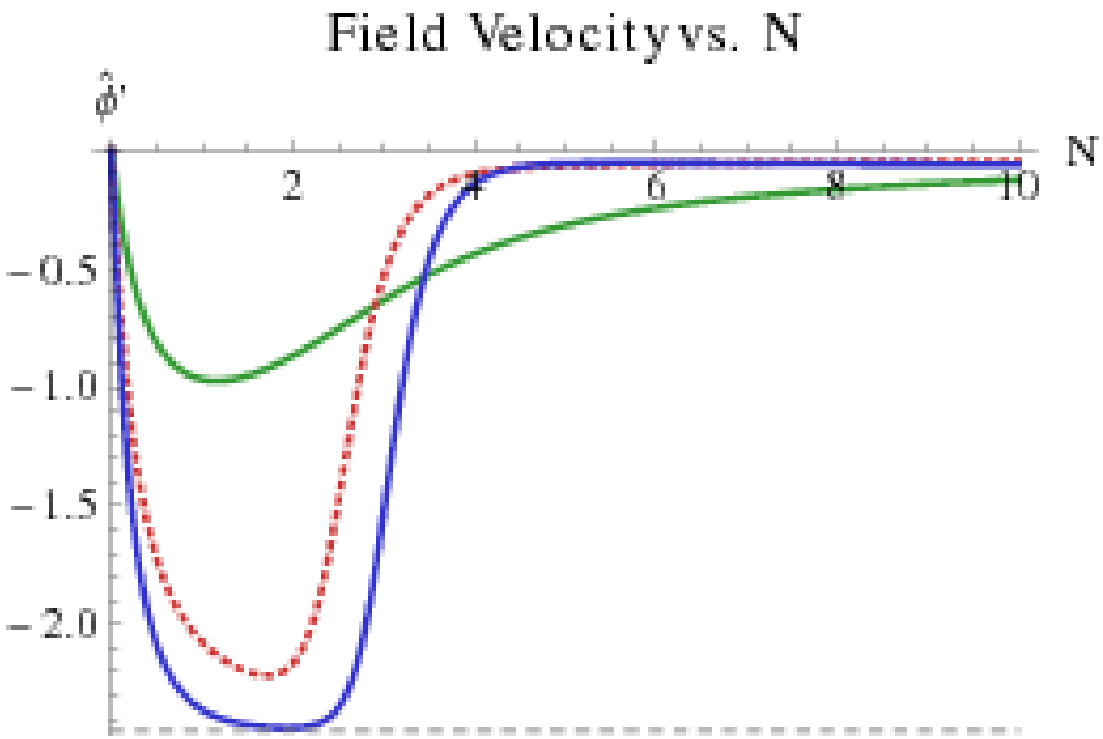
(Burgess,Cicoli,Quevedo),(Quevedo,Conlon),(Blanco-Pillado *et. al.*),...



Large Volume Scenario & Fibre Inflation

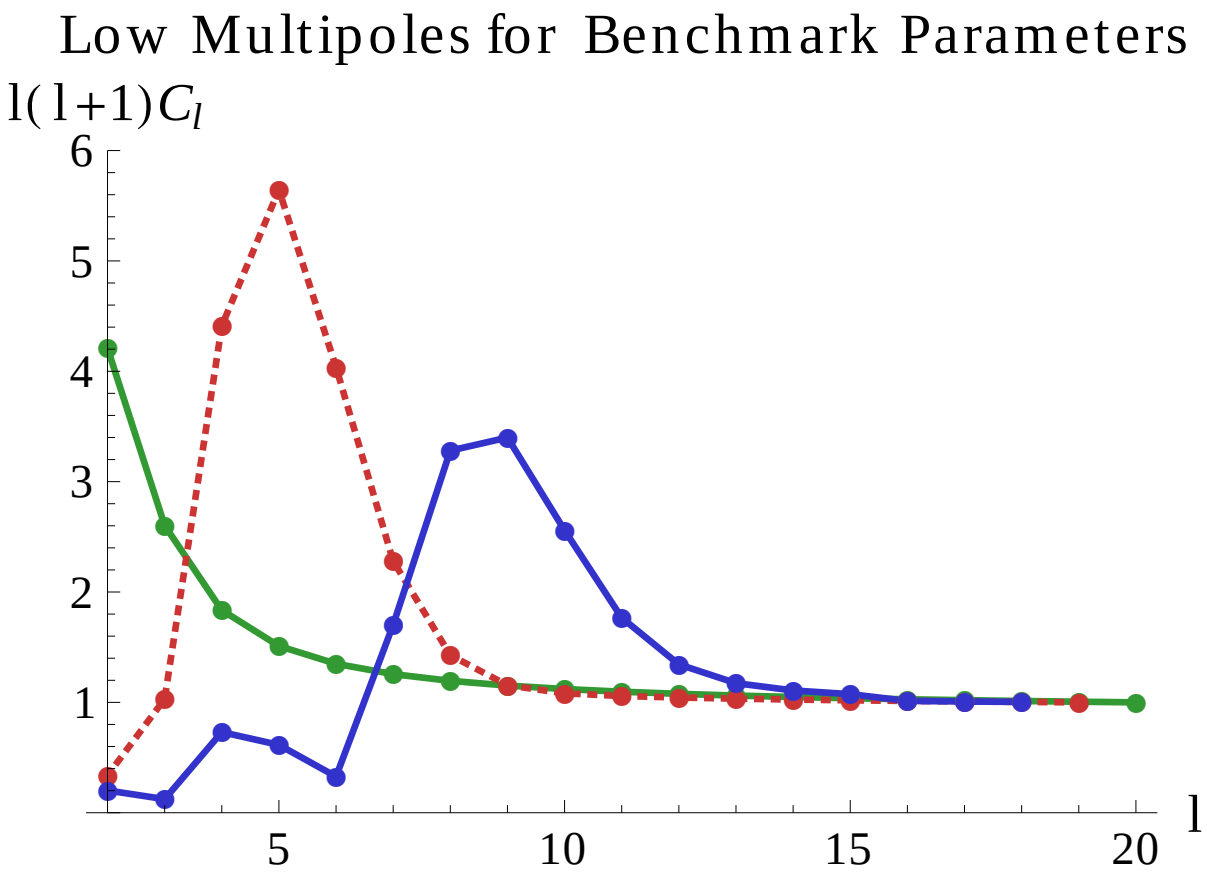
(Fibre) Power Suppression

(Cicoli,SD,Dutta 13),(Pedro,Westphal 13)



$$\frac{\partial}{\partial N}\log\frac{\partial\phi}{\partial N} \longleftrightarrow \frac{V_{\phi\phi}}{V} - \left(\frac{V_\phi}{V}\right)^2$$

(Fibre) Power Suppression



Conclusion

Planck Data suggests **very** slow-rolling **canonical** scalar

Inflection Point and **Starobinsky-like** potentials
abound in String Models

Both include "transition" effects to explain **low power**

What (if any) **correlations** can these embeddings of
inflation **reveal**?