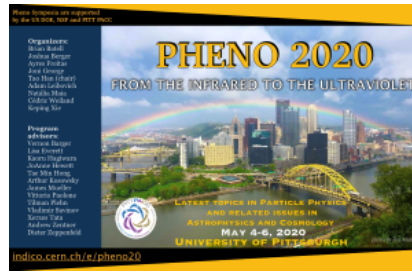


Phenomenology 2020 Symposium



Contribution ID: 1052

Type: **Parallel Talk**

States of Low Energy and the Initial State(s) of the Inflaton

Tuesday, 5 May 2020 14:30 (15 minutes)

In this talk we make a case for considering alternatives to the Bunch-Davies vacuum state for quantizing inflaton perturbations. The choice of vacuum state of a (free) quantum field theory in a generic (spatially flat) Friedmann-Robertson-Walker spacetime is unavoidably ambiguous, with two physically viable vacua potentially behaving drastically differently at small momentum. We consider a specific class of vacuum states, known as States of Low Energy (SLE), and show that the associated mode functions will always have a universal small momentum expansion in all Friedmann-Robertson-Walker spacetimes. This expansion also entails that the SLE two-point function for a massless theory will be infrared finite. Finally, we present the primordial power spectrum corresponding to the SLE, and find that it matches the Bunch-Davies power spectrum at high momentum, while showing relative power suppression of low momentum modes.

Summary

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Session Classification: Theoretical Developments & Extra Dimensions

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