

Fundamental physics in the cosmos: The early, the large and the dark Universe



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Extranatural Inflation and CMB observations

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The success of a given inflationary model crucially depends upon two features: its predictions for observables such as those of the Cosmic Microwave background (CMB) and its insensitivity to the unknown ultraviolet (UV) physics such as quantum gravitational effects. Extranatural inflation is a well motivated scenario which is insensitive to UV physics by construction. In this five dimensional model, the fifth dimension is compactified on a circle and the zero mode of the fifth component of a bulk U(1) gauge field acts as the inflaton. In this talk, I will present simple variations of the minimal extranatural inflation model which help in improving its CMB predictions while retaining its numerous merits. As will be presented, it is possible to obtain CMB predictions identical to those of e.g. Starobinsky model of inflation and show that this can be done in the most minimal way by having two additional light fermionic species in the bulk, with the same U(1) charges. I would then present the constraints that CMB observations impose on the parameters of the model. Finally, I would comment on the connections of this to the Weak Gravity Conjecture.

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