



High Energy Physics - Theory

Dynamical vs spectator models of (pseudo-)conformal Universe

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We discuss two versions of the conformal scenario for generating scalar cosmological perturbations: a spectator version with a scalar field conformally coupled to gravity and carrying negligible energy density, and a dynamical version with a scalar field minimally coupled to gravity and dominating the cosmological evolution. By making use of the Newtonian gauge, we show that (i) no UV strong coupling scale is generated below M_{Pl} due to mixing with metric perturbations in the dynamical scenario, and (ii) the dynamical and spectator models yield identical results to the leading non-linear order. We argue that these results, which include potentially observable effects like statistical anisotropy and non-Gaussianity, are characteristic of the entire class of conformal models. As an example, we reproduce, within the dynamical scenario and working in comoving gauge, our earlier result on the statistical anisotropy, which was originally obtained within the spectator approach.

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