

DYNAMICAL SYSTEMS IN PERTURBATIVE COSMOLOGY

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We introduce dynamical systems formulations and methods that lead to a global description of linear scalar and tensor cosmological perturbations. We then consider Λ CDM cosmology as a first simple and pedagogical example, which, e.g., allows us to contextualize the growing mode solution in a global state space picture, as well as discussing the validity of cosmological perturbations as approximations to the Einstein equations. If time permits, we shall then discuss perturbations of cosmological scalar fields, focusing first on the exponential potential, which forms the basic building block for more general scalar field potentials. This is exemplified with the scalar field representation of a modified Chaplygin gas, and quintessential inflation with α -attractors.