

Adiabatic modes (ADMs) play an essential role in derivation of soft theorems in Cosmology. They are defined as the physical perturbations (on the top of a fixed FRW universe), that can be locally removed by a local coordinate transformation. In this work we systematically construct the adiabatic modes and find new time-dependent ones. In the light of a new time dependent ADM for graviton, we prove that alternative theories to inflation enjoy asymptotic symmetries associated with soft gravitons. We point out the adiabaticity of vector perturbations and mention the relevance of this finding to primordial magnetogenesis. Finally, I show how to derive asymptotic symmetries for a specific imperfect fluid, namely a solid, and show some preliminary results.

Based on astro-ph/[1710.02177](#) and a work in progress.