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# Cosmological perturbations of TDiff fields

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## Abstract

We study scalar field theories that break diffeomorphism invariance down to the subgroup of transverse diffeomorphisms through the matter sector in cosmological backgrounds. We focus on single- and multi-field models and develop the corresponding cosmological perturbation theory. We analyze the different contributions to the pressure perturbation, discussing the adiabaticity and the effects in the perturbation coefficients of the interactions that arise in the multi-field case as a consequence of the symmetry breaking. We also consider the stability of the perturbations in terms of the effective speed of sound and present particular models that could be of phenomenological interest.

