

Problem Set 3 - Perturbations

1. Show that, to first order in perturbation theory, the equations of motion for the scalar, vector and tensor perturbations decouple.
2. Assuming that the matter content of the universe is a single real scalar field with action given by Eq. (52), express $\delta\rho$, δp , v , $v_{(v)}^i$, π , π_i and $\pi_{ij}^{(t)}$ in terms of $\delta\phi$ and the metric perturbation variables to lowest order in perturbation theory.