

## Strict solutions in the linear theory of cosmological perturbations up to second order

*Wednesday, 19 September 2018 11:00 (30 minutes)*

We consider scalar perturbations of the spatially flat Friedmann–Lemaître cosmological model. We formulate conditions for the metric functions under which basic gauge-invariant kinematic and dynamic fields of the perturbed model vanish at the first order of the linear perturbation theory. Then we combine these conditions to construct especially interesting perturbed models with specific properties. We particularly study the models with inhomogeneities characterized by the perfect fluid energy-momentum tensor and the models with inhomogeneities which behave monotonically with time. Finally, we perform the strict extension of the simplest cases of the considered models to the second order. We determine necessary assumptions for this development and present explicit solutions for the metric functions.

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