

## Macroscopic Einstein equations for a cosmological model with a $\lambda$ term

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### Abstract

© 2016, Pleiades Publishing, Ltd. By averaging the Einstein equations over transverse gravitational perturbations we obtain a closed set of two ordinary differential equations describing the macroscopic cosmological evolution of the isotropic spatially flat Universe filled with gravitational radiation. We have found an asymptotic solution of the evolution equation for the gravitational perturbation amplitude. Substituting this solution to the Einstein equations averaged over gravitational perturbations, we obtain a single nonlinear ordinary differential second-order evolution equation with respect to the macroscopic scale factor. We have also found a solution of the evolution equation for the scale factor in the WKB approximation which analytically describes the process of transformation from the ultrarelativistic mode of cosmological expansion to an inflationary one.

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