

The Problem of Initial Conditions for Primordial Black Hole Formation and Asymptotic Quasi-Homogeneous Solution

Abstract

According to the asymptotic quasi-homogeneous solution near a cosmological singularity an arbitrary curvature profile does not depend on time, while perturbations of energy density and velocity vanish asymptotically at the singularity. The asymptotic quasi-homogeneous solutions of the first and second order are used to set self-consistent initial conditions for subsequent numerical simulations of primordial black hole formation.