2007 Vol.47 No.2 pp.379-384 DOI:

# Friedmann Cosmology with a Generalized Equation of State and Bulk Viscosity

MENG Xin-He, REN Jie, and HU Ming-Guang

Department of Physics, Nankai University, Tianjin 300071, China
(Received: 2006-3-29; Revised: )

Abstract: The universe content is considered as a non-perfect fluid with bulk viscosity and is described by a more general equation of state (endowed some deviation from the conventionally assumed cosmic perfect fluid model). We assume the bulk viscosity is a linear combination of two terms: one is constant, and the other is proportional to the scalar expansion $\theta=3\dot{a}/a$. The equation of state is described as $p=(\gamma-1)\rho+p_0$, where $p_0$ is a parameter. In this framework we demonstrate that this model can be used to explain the dark energy dominated universe, and different proper choices of the parameters may lead to three kinds of fates of the cosmological evolution: no future singularity, big rip, or Type-III singularity as presented in [S. Nojiri, S.D. Odintsov, and S. Tsujikawa, Phys. Rev. D 71 (2005) 063004].

PACS: 98.80.Cq, 98.80.-k

Key words: Friedmann cosmology, equation of state, bulk viscosity, dark energy

[Full text: PDF]

Close