Alho, Artur; Bessa, Vitor; Mena, Filipe C.
Global dynamics of Yang-Mills field and perfect-fluid Robertson-Walker cosmologies. (English) [Zbl 1441.83005]

The authors apply a global dynamical system formulation of the Friedmann-Robertson-Walker cosmological solutions with a massless and massive Yang-Mills field and a perfect fluid with linear equation of state as the matter sources. This allows to give proofs concerning the dynamics of the model including source dominance toward the past and future time directions. In a case of a massless Yang-Mills field, the authors reformulate the well-known existing results in a global compact state space picture.

Reviewer: Alex B. Gaina (Chisinau)

MSC:
83C05 Einstein’s equations (general structure, canonical formalism, Cauchy problems)
83C55 Macroscopic interaction of the gravitational field with matter (hydrodynamics, etc.)
83C20 Classes of solutions; algebraically special solutions, metrics with symmetries for problems in general relativity and gravitational theory
70S15 Yang-Mills and other gauge theories in mechanics of particles and systems
81T13 Yang-Mills and other gauge theories in quantum field theory
83F05 Relativistic cosmology
53Z05 Applications of differential geometry to physics
37A10 Dynamical systems involving one-parameter continuous families of measure-preserving transformations
35Q76 Einstein equations

Keywords:
equations of state; fundamental constants; metric geometry; Einstein field equations; coupling constants; dynamical systems; general relativity; vector fields; covariant formulations; cosmology

Full Text: DOI

References:


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