

Abstract

Algebraic Solutions in Scalar Field Cosmology: Reconstruction of the Dark-Energy Equation of State and the Inflationary Potential [†]

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An algebraic solution for arbitrary potential is presented in the context of scalar field cosmological models. That result is used to generate new solutions of the scalar field equations in homogeneous and isotropic universes. A series of generalizations of the Chaplygin gas and bulk viscous cosmological solutions for inflationary universes are found. Finally, we show how the Hubble slow-roll parameters can be calculated using the solution algorithm and we compare these inflationary solutions with the observational data provided by the Planck 2015 collaboration to constraint and rule out some of these models.



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