Modified Chaplygin Gas and Solvable F-essence Cosmologies

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The Modified Chaplygin Gas (MCG) model belongs to the class of a unified models of dark energy and dark matter. In this paper, we have modeled MCG in the framework of f-essence cosmology. By constructing an equation connecting the MCG and the f-essence, we solve it to obtain explicitly the pressure and energy density of MCG. As special cases, we obtain both positive and negative pressure solutions for suitable choices of free parameters. We also calculate the state parameter which describes the phantom crossing.

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