

Reconstruction of Holographic Dark Energy in Chameleon Brans-Dicke Cosmology

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Abstract : Accelerated expansion of the current universe is well-established in the literature. Dark energy and modified gravity are two approaches to account for this accelerated expansion. In the present work, we consider scalar field models of dark energy, namely, tachyon and DBI essence in the framework of chameleon Brans-Dicke cosmology. The equation of state parameter is reconstructed and the subsequent cosmological implications are studied. We examined the stability for the obtained solutions of the crossing of the phantom divide under a quantum correction of massless conformally invariant fields and we have seen that quantum correction could be small when the phantom crossing occurs and the obtained solutions of the phantom crossing could be stable under the quantum correction. In the subsequent phase, we have established a correspondence between the NHDE model and the quintessence, the DBI-essence and the tachyon scalar field models in the framework of chameleon Brans-Dicke cosmology. We reconstruct the potentials and the dynamics for these three scalar field models we have considered. The reconstructed potentials are found to increase with the evolution of the universe and in a very late stage they are observed to decay.

Keywords : dark energy, holographic principle, modified gravity, reconstruction

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