

An interacting scenario for dark energy in a Bianchi type-I universe

ABSTRACT

We study the interaction between dark energy (DE) and dark matter in the scope of anisotropic Bianchi type-I space-time. First we derive the general form of the DE equation of state (EoS) parameter in both non-interacting and interacting cases and then we examine its future by applying a hyperbolic scale factor. It is shown that in the non-interacting case, depending on the value of the anisotropy parameter K , the DE EoS parameter varies from phantom to quintessence whereas in the interacting case the EoS parameter varies in the quintessence region. However, in both cases, the DE EoS parameter ω_{de} ultimately (i.e. at $z = -1$) tends to the cosmological constant ($\omega_{de} = -1$). Moreover, we fix the cosmological bound on the anisotropy parameter K by using recent observational data about the Hubble parameter.

Keyword: Cosmology; Bianchi type-I model; Dark energy; Dark matter