

LRS Bianchi type-V cosmology with heat flow

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In this paper we present a spatially homogeneous locally-rotationally-symmetric (LRS) Bianchi type-V cosmological model with perfect fluid and heat flow. A general approach is introduced to solve Einstein's field equations by using a law of variation for the mean Hubble parameter, which is related to the average scale factor of the model that yields a constant value for the deceleration parameter. The law generates power-law and exponential forms for the average scale factor in terms of the cosmic time t . Exact solutions that correspond to singular and non-singular models are found with heat flow. We find that a constant value of the deceleration parameter is reasonable for a description of the different phases of the universe. The physical constraints on the solutions of the field equations, and, in particular, the thermodynamical laws and energy conditions that govern such solutions are discussed in some detail. The dynamical behaviors of the solutions and kinematical parameters like expansion, shear and the anisotropy parameter are discussed in detail in each section.