

COMPARATIVE ANALYSIS OF STANDARD Λ CDM AND Λ CS MODELS

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S u m m a r y

We draw a comparison of time-dependent cosmological parameters calculated in the standard Λ CDM model with those of the model of a homogeneous and isotropic Universe with non-zero cosmological constant filled with a perfect gas of low-velocity cosmic strings (Λ CS model). It is shown that pressure-free matter can obtain the properties of a gas of low-velocity cosmic strings in the epoch, when the global geometry and the total amount of matter in the Universe as a whole obey an additional constraint. This constraint follows from the quantum geometrodynamical approach in the semiclassical approximation. In terms of general relativity, its effective contribution to the field equations can be linked to the time evolution of the equation of state of matter caused by the processes of redistribution of the energy between matter components. In the present article, the exact solutions of the Einstein equations for the Λ CS model are found. It is demonstrated that this model is equivalent to the open de Sitter model. After the scale transformation of the time variable of the Λ CS model, the standard Λ CDM and Λ CS models provide the equivalent descriptions of cosmological parameters as functions of time at equal values of the cosmological constant. The exception is the behavior of the deceleration parameter in the early Universe.