Accelerated Expansion of the Universe in Bounce Cosmology

Juan Francisco Martell Caldera
University of Guadalajara, Mexico

Abstract:

The standard cosmological model faces several fundamental challenges, one of which is the problem of the initial singularity. In response, new alternative models, such as bouncing cosmology, have been developed to address this issue. In this work, we analyze the accelerated expansion of the universe within the framework of bouncing cosmology using the modified Friedmann equations. We establish a comparison between the descriptions of the universe in both the standard cosmological model and the bouncing model. The study focuses on deriving the dynamic equations for the scale factor that approximates our universe, and the equations for the deceleration parameter for each model. Our results show that both cosmological models exhibit similar accelerated expansion behavior, with no significant differences observed between the two models in the present era. This indicates that the bouncing cosmology model can provide a viable alternative to the standard model, at least in the current cosmic phase. This research was conducted in collaboration with Dr. José Edgar Madriz Aguilar and supported by the University of Guadalajara.