

Cosmological Constant Effects on the Properties of Mass Twin Compact Stars

We present a systematic investigation of the cosmological constant effects in compact stars in the framework of Einstein's gravity. Consideration of a cosmological constant Λ in compact stars is based on the mechanism of acceleration of the universe, where Λ plays the role of dark energy. In particular, we consider compact star mass twins, hybrid neutron stars that populate both the second and third branch of the mass-radius diagram [1,2]. For those models, consideration of excluded volume effects in the equation of state, resulting from the finite size volume of nucleons, leads to a stiffening of matter thus the corresponding compact stars acquire higher mass and radius values, as shown in [3]. A similar behavior has been shown in [4,5] where certain values of the cosmological constant can also increase the compact star properties. In this work, we study for the first time such effects in compact star mass twins where we observe the interplay between excluded volume effects and the cosmological constant. We finalize with a discussion on the consequences of these results for population evolution of black holes and pulsars.

References:

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