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Dynamical system with anisotropic tachyon field

We studied a dark energy (DE) model with tachyonic fields coupled to a vector field in a Bianchi-I anisotropic background. Then, the dynamical analysis of the differential equations was made using a Monte Carlo approach in the parameters space, in order to restrict the physically allowed regions having anisotropic DE as an attractor. Next, the boundary of the region was fitted, that was how we obtained an approximate analytical expression for the region that we got numerically. The differential equations could therefore be solved by taking parameters within the allowed region and setting the initial conditions in the radiation era. We obtained the evolution of the density parameters, the shear and the effective equation of state of the Universe and of the DE, which behaved in a similar manner in the late time evolution of the Universe, having values near to -1. Furthermore, the shear for this evolution took non-zero values and it was stabilized depending on the parameters. Finally, the largest amount of fluctuations in the DE equation of state and the shear was found around the DE-Matter phase transition due to the interaction between the tachyonic and vector fields.

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