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Dynamics of anisotropic dark energy universe embedded in one-directional magnetized fluid

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This work discovers few extraordinary features of an anisotropic dark energy cosmological model in a two fluid situation such as the usual dark energy and the electromagnetic fluid. We have assumed the dark energy pressure to be anisotropic in spatial directions in terms of skewness parameters and have been studied their behavior through cosmic evolution. In order to yield a healthy mathematical formalism of the model, we have considered the scale factor as hybrid scale factor; a combination of both power law and volumetric (de Sitter) expansion law, showing a transitional phase in between. The physical parameters are derived, analyzed and found to be in agreement with recent observational data. The evolution of Equation of State parameter obtained here, presents a scenario which is consistent with three different stages of evolutionary universe, namely; radiation dominated, matter dominated and dark energy dominated era. Also this work clearly compares the effect of magnetized fluid over other cosmic fluids (discussed in our earlier works) along with dark energy fluid. Moreover, we observed that electromagnetic fluid extremely dominates the early phase of evolution than any other cosmic fluids. Whereas, the late cosmic epoch is completely filled and driven by dark energy fluid. Also, we diagnosed the model through state-finder parameters and compared with Λ CDM model to convey the physical acceptability of it.

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