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The cosmology of viscous generalised Chaplygin gas under the purview of f (T) gravity and the model assessment through a machine learning approach

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In this paper, we present an analysis of the generalised Chaplygin gas (GCG) in the presence of bulk viscosity. Reconstruction techniques have been shown in the context of interacting scenarios and viscous cosmological settings using the Einstein and modified $f(T)$ gravity paradigm (where T is the torsion scalar). Additionally considered are instances that are not viscous. Under different conditions, the equation of state (EoS) parameter has been investigated, and the stability of the models has been assessed using the sign of the squared speed of sound. The GCG interacting with pressure-less dark matter was found to behave like a quintom in the presence of bulk viscosity, and a quintessence-like behaviour was reported in the non-viscous situation. In spite of the existence of bulk viscosity, the reconstructed GCG turns out to be stable against small perturbations. Last but not least, statistical analysis, Shannon entropy, and Gaussian Mixture Model have been used to evaluate the reconstruction method.

Primary author: SAHA, Sanghati (Department of Mathematics, Amity University Kolkata)

Co-author: CHATTOPADHYAY, Surajit (Amity University, Kolkata, India)

Presenter: SAHA, Sanghati (Department of Mathematics, Amity University Kolkata)

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