A RECONSTRUCTION SCHEME FOR F(T) GRAVITY THROUGH INTERACTING VARIABLE-GENERALISED CHAPLYGIN GAS FORM OF DARK ENERGY AND ITS THERMODYNAMICS

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- **Abstract**

Here we report a study on variable-generalised Chaplygin gas (VGCG) interacting with pressureless dark matter (DM) with interaction term Q chosen in the form $Q=3H\delta\rho_\Lambda$. We present a reconstruction scheme for *f(T)* gravity based on the interacting VGCG with power-law form of scale factor. Also, we study the generalised second law (GSL) of thermodynamics in reconstructed *f(T)* cosmology. Finally, we study GSL for logarithmic and power-law corrected entropies in the reconstructed *f*(T) framework.

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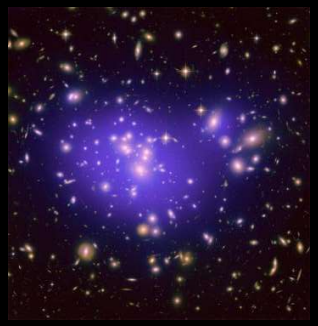


IWARA

From Quarks to Cosmos

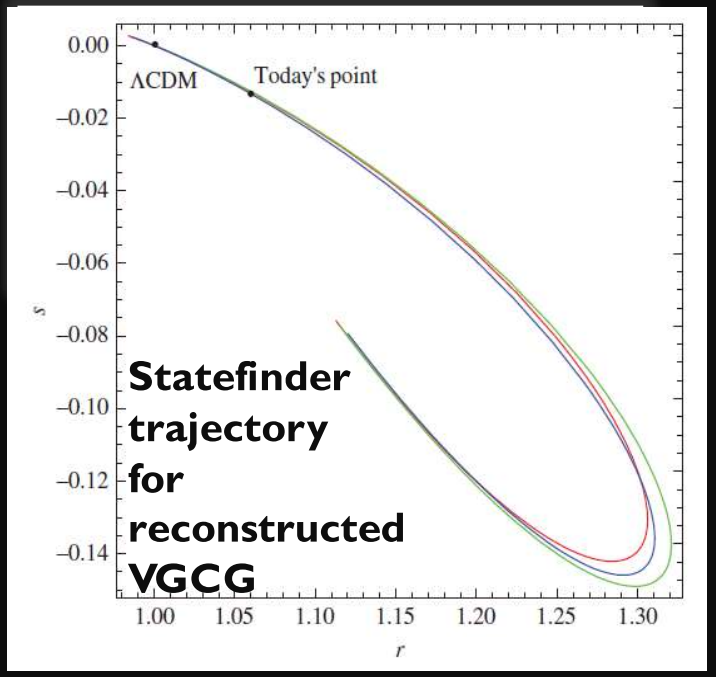
$$p_\Lambda = -\frac{A_0 a^{-n}}{\rho_\Lambda^{\alpha}}$$

VGCG

$$\dot{\rho}_\Lambda + 3H(p_\Lambda + \rho_\Lambda) = -Q,$$

Interacting scenario

$$\dot{\rho}_m + 3H\rho_m = Q.$$



Statefinder trajectory for reconstructed VGCG

Interacting VGCG is considered and the EoS parameters is found to be quintom and consistent with observation. Also, ΛCDM fixed point is attainable by the statefinder trajectory

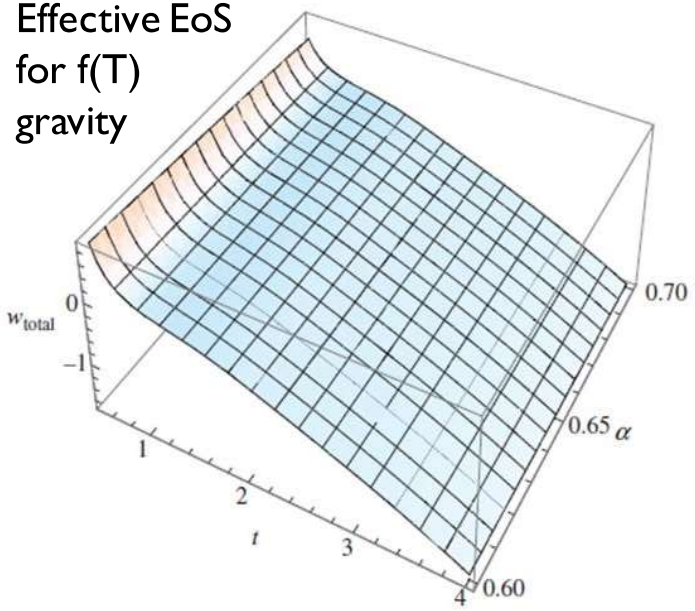
f(T) gravity reconstructed through interacting VGCG is found to generate a quintom like EoS and is found to satisfy a sufficient condition for a realistic model.

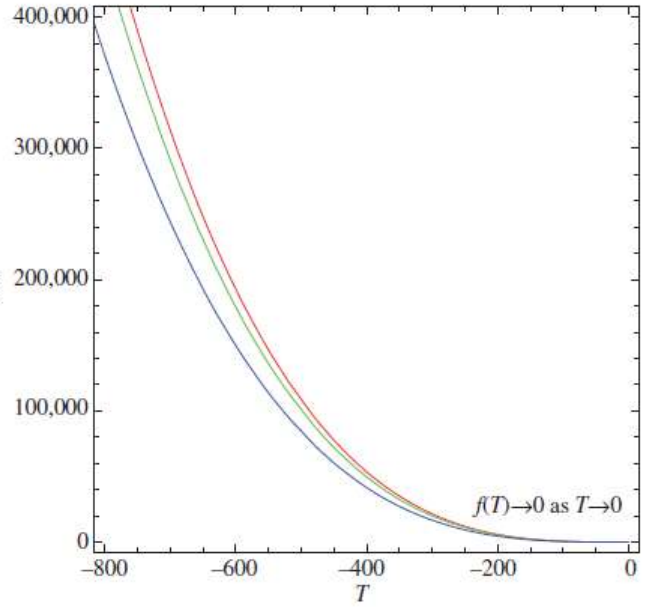
GSL is found to be always valid in the case of usual Bekenstein–Hawking area law and and has unconditional validity in logarithm correction with future event horizon as the enveloping surface of the universe.

KEY RESULTS AND MAIN CONCLUSIONS

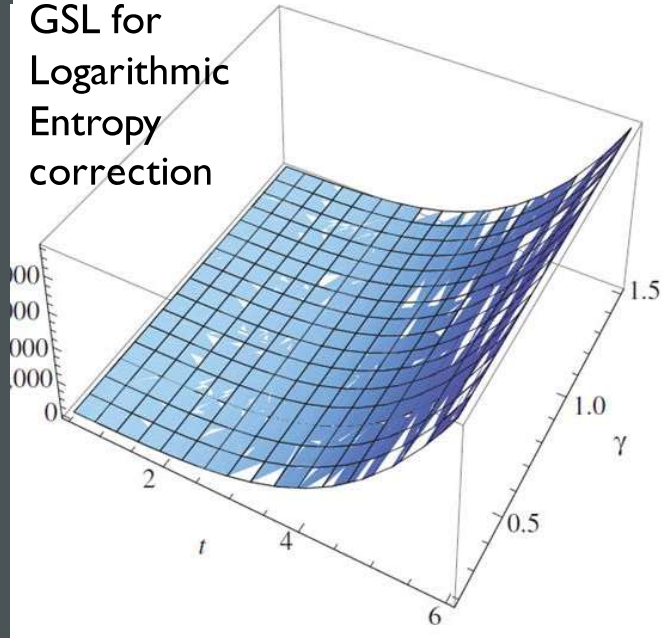
- EoS parameter is consistent with the observational results and EoS parameter has been marked to behave like "quintom";
- •The reconstructed *f(T)* model has been obtained in the interacting VGCG scenario;
- •$f(T) \rightarrow 0$ *as* $T \rightarrow 0$ •Reconstructed effective EoS parameter crosses phantom boundary;
- • GSL has failed to hold in power-law correction and has unconditional validity in logarithm correction.

Effective EoS for f(T) gravity





GSL for Logarithmic Entropy correction



EoS evolution for VGCG