

Towards galaxy cluster models in Aether-Scalar-Tensor theory

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The Aether-Scalar-Tensor (AeST) theory is an extension of General Relativity (GR) which allows for Modified Newtonian Dynamics (MOND) in its static weak-field limit and a Λ CDM-like cosmological limit.

MOND successfully describes the behaviour of galaxies without the need for dark matter. This is best summarised by the Radial Acceleration Relation (RAR), which directly relates the observed gravitational acceleration to the acceleration expected from the gravity of the baryons alone. However, it is generally accepted that MOND fails to account for the state of galaxy clusters, apparently needing missing matter to fit the observations.

We consider static spherically symmetric weak-field solutions of AeST and study the hydrostatic isothermal gaseous sphere as a simplified model of a galaxy cluster in AeST. We construct the RAR of AeST for isothermal spheres and find that the AeST RAR for isothermal spheres in certain cases shares qualitative features also found in the observational RAR for galaxy clusters, illustrating the potential of AeST to address the shortcomings of MOND in galaxy clusters.

I read the instructions above

Alternate track

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