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Stellar lumps of mass varying particles

The theoretical conception of compact structures that share the key features of mass varying mechanisms provides by itself the conditions for establishing the equilibrium and stability of stellar massive objects.
We investigate static, spherically symmetric solutions of Einstein equations for a fluid of mass varying particles of non-baryonic matter (neutrinos or dark matter) which forms stable structures through attractive forces mediated by a background scalar-field (dark energy).
Assuming that the non-baryonic matter consists in a gas of weakly interacting particles, for practical reasons, the coupling with the scalar field is converted into a dependence of the mass on the radial coordinate of the curved space-time.
The stability analysis reveals that our static solutions become dynamically unstable for different Buchdahl's limits of the ratio between the total mass-energy and the stellar radius, M
bbR/R.
An external observer can also find regular solutions that have Schwarzschild black-holes similar characteristics.
Our analysis leaves open the questions whether such solutions exist, which are both regular and stable.

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