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A DHOST to unify them all (?)

The standard cosmological model (LCDM) requires 68% of Dark Energy, modelled as a Cosmological Constant, to explain the late-time accelerated expansion of our Universe, and 27% of Dark Matter to describe its Large Scale Structure. But the nature of both Dark Energy and Dark Matter is unknown at the present stage. From some point of view, these two components seem to emerge as problems when General Relativity is considered as the ultimate theory of gravity. But a possible solution to their mystery could be the introduction of a more general theory of gravity. This path leads to the so-called Extended Theories of Gravity (ETGs). However, ETGs have been so far mainly introduced only to explain Dark Energy. An interesting, relatively new question is: "Could Dark Matter and Dark Energy, defined as different components in the standard model, be considered as two different effects of the same theory of gravity?" To answer this question, I will consider an ETG model belonging to the family of Degenerate Higher-Order Scalar Tensor Theories (DHOST). The possible unification of Dark Energy and Dark Matter will be then analyzed using multi-variate data (gravitational lensing, X-ray, galactic dynamics, and kinematics) covering a large range of gravitational structures, from galaxy clusters to galactic scales.

Serdecznie zapraszam,
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