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Einstein Yang-Mills Higgs dark energy revisited

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Inspired in the Standard Model of Elementary Particles, the Einstein Yang-Mills Higgs action with the Higgs field in the $SU(2)$ representation was proposed in Class. Quantum Grav. 32 (2015) 045002 as the element responsible for the dark energy phenomenon. We revisit this action emphasizing in a very important aspect not sufficiently explored in the original work and that substantially changes its conclusions. This aspect is the role that the Yang-Mills Higgs interaction plays at fixing the gauge for the Higgs field, in order to sustain a homogeneous and isotropic background, and at driving the late accelerated expansion of the Universe by moving the Higgs field away of the minimum of its potential and holding it towards an asymptotic finite value. We analyse the dynamical behaviour of this system and supplement this analysis with a numerical solution whose initial conditions are in agreement with the current observed values for the density parameters. This scenario represents a step towards a successful merging of cosmology and well-tested particle physics phenomenology.

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