

*Name:*

Marius Oltean

*Title:*

Cosmological Perturbations in Antigravity

*Abstract:*

We compute the evolution of cosmological perturbations in a recently proposed Weyl-symmetric theory of two scalar fields with oppositely-signed conformal couplings to Einstein gravity. It is motivated from the minimal conformal extension of the Standard Model, such that one of these scalar fields is the Higgs while the other is a new particle, the dilaton, introduced to make the Higgs mass conformally symmetric. At the background level, the theory admits novel geodesically-complete cyclic cosmological solutions characterized by a brief period of repulsive gravity, or “antigravity,” during each successive transition from a Big Crunch to a Big Bang. We show that despite the necessarily wrong-signed kinetic term of the dilaton in the full action, its isotropic cosmological solutions are stable at the perturbative level.