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Cosmological Perturbations in Antigravity

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We compute the evolution of cosmological perturbations in a recently proposed Weyl-symmetric theory of two scalar fields with oppositely-signed kinetic terms and conformal couplings (in lieu of minimal coupling) to Einstein gravity. 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 wrong-signed kinetic term in the full action, these solutions are well-behaved (i.e. ghost-free) at the perturbative level.

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