

# Cosmological Consequences of Unconstrained Gravity and Electromagnetism

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Motivated by the quantum description of gauge theories, we study the phenomenological effects of relaxing the Hamiltonian and momentum constraints in general relativity. We show that the unconstrained theory has new source terms that mimic a pressureless dust that only follows geodesics. The source term may be the simplest explanation for dark matter and generically predicts a charged component. We comment that the discovery of such terms would rule out inflation and be a direct probe of the initial conditions of the universe.

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