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Emergent Gravity from Vanishing Energy-Momentum Tensor[1]
JOSHUA ERLICH, College of William and Mary — We propose a constraint of vanishing energy-momentum tensor for quantum gravity. We are led to a metric-independent effective theory similar to the Dirac-Born-Infeld theory with vanishing gauge fields, modulated by a scalar potential. In the limit of a large number of fields, we explicitly demonstrate the existence of a composite massless spin-2 graviton in the spectrum that couples to matter as in Einstein gravity. We comment on the cosmological constant problem, the generalization to theories of fermions and gauge fields, and the relation to other approaches to quantum gravity.

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