

Abstract Submitted
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Unifying Gravity and EM: A Riddle You Can Solve DOUGLAS

SWEETSER — Apply three rules to this riddle:

1. Start from standard theory
2. Work with quantum mechanics
3. No new math

Start from the vacuum Hilbert-Maxwell action:

$$S_{H-M} = \int \sqrt{-g} d^4x \left(R - \frac{1}{4c^2} (\nabla^\mu A^\nu - \nabla^\nu A^\mu) (\nabla_\mu A_\nu - \nabla_\nu A_\mu) \right)$$

The Hilbert action cannot be quantized, so drop the Ricci scalar. To do more than EM, use an asymmetric tensor:

$$S_{GEM} = \int \sqrt{-g} d^4x \frac{1}{4c^2} \nabla^\mu A^\nu \nabla_\mu A_\nu$$

The metric is fixed up to a diffeomorphism. With a constant potential, the Rosen metric solves the field equations, is consistent with current tests, but predicts 0.7 μ arcseconds more bending around the Sun than GR. Gauge symmetry is broken by the mass charge of particles.

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