

## Nikola Paunkovic and Marko Vojinovic

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### Gravity-Matter Entanglement in Regge Quantum Gravity

We show that Hartle-Hawking states in the Regge quantum gravity model generically contain non-trivial entanglement between gravity and matter fields. Generic impossibility to talk about “matter in a point of space” is in line with the idea of an emergent spacetime, and as such could be taken as a possible candidate for a criterion for a plausible theory of quantum gravity. Finally, this new entanglement could be seen as an additional “effective interaction”, which could possibly bring corrections to the weak equivalence principle.

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