



Newton's laws of motion can generate gravity-mediated entanglement

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Whether gravity is fundamentally quantum or not is still a debated question. On one side, there are several well-established quantum-gravity theories, on the other, there are semi-classical descriptions that treat the gravity field as a classical measurement-feedback channel. While the lack of experimental evidence leaves this issue unresolved, proposals involving interference experiments with massive particles aim to test whether gravitational interactions generate quantum entanglement. However, we argue that such experiments are insufficient to exclude all classical descriptions of gravity. Specifically, we show that the same entanglement can be achieved through a classical evolution in the phase space. This highlights the need for alternative experimental designs to conclusively probe the quantum nature of gravity.

