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Testing tunnelling with gravity: quantum simulators

Thursday, 25 July 2019 10:00 (30 minutes)

This is the second of three talks exploring the feasibility building a quantum simulator for testing vacuum decay.

I will describe some of the basic features that a BEC system would need in order to simulate cosmological vacuum decays in the laboratory. These include Klein-Gordon like behaviour and a ground state structure with metastable phases. Up to now, the proposals have suffered from a parametric growth of instabilities. I will indicate a way forward, and outline how the theory of bubble nucleation can be adapted to BEC's at zero and slightly non-zero temperature.

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