

# Supergravity on a 3-Torus: Quantum Linearisation Instabilities with a Supergroup

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For closed universes, the Einstein equations (EE) are linearisation unstable. Perturbing around any background with Killing symmetries the linearised EE admit solutions which are not themselves linearisations of solutions to the non-linear EE. To control these spurious solutions, quadratic linearisation stability conditions are imposed. However, in the quantum theory these stability conditions require that all physical states must be invariant under the background symmetries, which can complicate the construction of the physical Hilbert space. I will review linearisation stability conditions in both classical and quantum gravity, and then discuss a simple supersymmetric model to study quantum linearisation instabilities with a supergroup.

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