NEC violation: Tunnelling versus Casimir effect

Monday 9 January 2023 13:50 (25 minutes)

Tunneling between degenerate vacua is allowed in a finite volume, and leads to a non-extensive symmetric ground state. This talk displays how this leads to a violation of the Null Energy Condition for small enough temperatures, assuming a continuous set of momenta in the finite volume containing the field. Taking into account discrete momenta can modify this picture, and is achieved by adding the Casimir energy to the tunneling-induced ground state energy. Focusing on zero-temperature, it is shown that these non-trivial effects compete when the typical size of the box containing the field is of the order of the particle's Compton wavelength.

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