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Radiative effects in decay of metastable vacua: a Green's function approach

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We introduce a Green's function method for handling radiative effects on the decay of metastable vacua. In the context of phi-4 theory, we are able to calculate analytically both the functional determinant of the quadratic fluctuations about the soliton configuration as well as the first correction to the soliton configuration itself. The latter is made feasible by employing the thin-wall approximation and treating the bubble wall in the planar limit. In so doing, the problem of tunnelling in radiatively generated potentials may be reduced to one of solving one-dimensional ordinary differential equations and integrals.

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