

Functional integral for non-Lagrangian systems

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A novel functional integral formulation of quantum mechanics for non-Lagrangian systems is presented. The new approach, which we call "stringy quantization," is based solely on classical equations of motion and is free of any ambiguity arising from Lagrangian and/or Hamiltonian formulation of the theory. The functionality of the proposed method is demonstrated on several examples. Special attention is paid to the stringy quantization of systems with a general A -power friction force $-\kappa[\dot{q}]^A$. Results for $A = 1$ are compared with those obtained in the approaches by Caldeira-Kanai, Bateman and Kostin. Relations to the Caldeira-Leggett model and to the Feynman-Vernon approach are discussed as well.

Comments: 14 pages, 7 figures, corrected typos

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