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stochastic force; 3.1.5 Displacement correlation function; 3.1.6 Thermal propagator and imaginary-time correlations; 3.1.7 Ohmic and frequency-dependent damping; 3.1.8 Fractional Langevin equation; 3.1.9 Rubin model
3.1.10 Interaction of a charged particle with the radiation field3.2 Ergodicity; 3.3 The spin-boson model; 3.3.1 The model Hamiltonian; 3.3.2 Flux and charge qubits: reduction to the spin-boson model; 3.4 Microscopic models; 3.4.1 Acoustic polaron: one-phonon and two-phonon coupling; 3.4.2 Optical polaron; 3.4.3 Interaction with fermions (normal and superconducting); 3.4.4 Superconducting tunnel junction; 3.5 Charging and environmental effects in tunnel junctions; 3.5.1 The global system for single electron tunneling; 3.5.2 Resistor, inductor, and transmission lines
3.5.3 Charging effects in junctions3.6 Nonlinear quantum environments; 4 Imaginary-time approach and equilibrium dynamics; 4.1 General concepts; 4.1.1 Density matrix and reduced density matrix; 4.1.2 Imaginary-time path integral; 4.2 Effective action and equilibrium density matrix; 4.2.1 Open system with bilinear coupling to a harmonic reservoir; 4.2.2 State-dependent memory friction; 4.2.3 Spin-boson model; 4.2.4 Acoustic polaron and defect tunneling: one-phonon coupling; 4.2.5 Acoustic polaron: two-phonon coupling; 4.2.6 Tunneling between surfaces: one-phonon coupling; 4.2.7 Optical polaron
4.2.8 Heavy particle in a metal4.2.9 Heavy particle in a superconductor; 4.2.10 Effective action of a junction; 4.2.11 Electromagnetic environment; 4.3 Partition function of the open system; 4.3.1 General path integral expression; 4.3.2 Semiclassical approximation; 4.3.3 Partition function of the damped harmonic oscillator; 4.3.4 Functional measure in Fourier space; 4.3.5 Partition function of the damped harmonic oscillator revisited; 4.4 Quantum statistical expectation values in phase space; 4.4.1 Generalized Weyl correspondence; 4.4.2 Generalized Wigner function and expectation values
5 Real-time path integrals and nonequilibrium dynamics

Sommario/riassunto

Starting from first principles, this book introduces the fundamental concepts and methods of dissipative quantum mechanics and explores related phenomena in condensed matter systems. Major experimental achievements in cooperation with theoretical advances have brightened the field and brought it to the attention of the general community in natural sciences. Nowadays, working knowledge of dissipative quantum mechanics is an essential tool for many physicists. This book - originally published in 1990 and republished in 1999 and 2008 as enlarged second and third editions - delves significantl