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effects in tunnel junctions; 3.4.1 The global system €or single electron tunneling; 3.4.2 Resistor, inductor and transmission lines; 3.4.3 Charging effects in Josephson junctions; 3.5 Nonlinear quantum environments; 4 Imaginary-time path integrals; 4.1 The density matrix: general concepts; 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 model4.2.4 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 metal; 4.2.9 Heavy particle in a superconductor; 4.2.10 Effective action for a Josephson 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 dynamics; 5.1 Feynman-Vernon method for a product initial state; 5.2 Decoherence and friction; 5.3 General initial states and preparation function; 5.4 Complex-time path integral for the propagating function; 5 5 Real-time path integral for the propagating function; 5.5.1 Extremal paths; 5.5.2 Classical limit
5.5.3 Semiclassical limit: quasiclassical Langevin equation

Sommario/riassunto

Major advances in the quantum theory of macroscopic systems, in combination with stunning experimental achievements, have brightened the field and brought it to the attention of the general community in natural sciences. Today, working knowledge of dissipative quantum mechanics is an essential tool for many physicists. This book - originally published in 1990 and republished in 1999 as an enlarged second edition - delves much deeper than ever before into the fundamental concepts, methods, and applications of quantum dissipative systems, including the most recent developments. In this third e