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COUPLED TO THE QUANTIZED RADIATION FIELD - INTERACTING CASE; Small Oscillations in Some Nonlinear PDE's; 1 Introduction; 2 The finite dimensional case; 3 The infinite dimensional case: some known results; 4 A proof of Lyapunov center theorem: the finite dimensional case; 5 The resonant case
6 A proof of the Lyapunov center theorem: the infinite dimensional case7 On the verification of the property y-NR; 8 Applications; The Semi-Classical Van-Vleck Formula. Application to the Aharonov-Bohm Effect; 1 Introduction; 2 Coherent states and quantum propagator; 3 Semi-classical approximation for the propagator; 4 The time-dependent Aharonov-Bohm Effect; Fractal Dimensions and Quantum Evolution Associated with Sparse Potential Jacobi Matrices; 1 Introduction; 2 The sparse barrier model and main results; 3 Pictures of quantum motion within sparse barriers; 4 Proof of Theorem 2
5 Proof of Theorem 36 Conclusions; Infinite Step Billiards; 1 Introduction; 2 The model and the results; 3 Outline of the proofs; Semiclassical Expansion for the Thermodynamic Limit of the Ground State Energy of Kac's Operator; 1 Introduction; 2 One-parameter families of weighted standard functions; 3 WKB constructions; 4 A formal asymptotic expansion; 5 Estimates for the thermodynamic limit; Asymptotics of Scattering Poles for Two Strictly Convex Obstacles; 1. INTRODUCTION; 2. METHOD OF THE PROOF; 3. EXPRESSION OF BROKEN RAYS CONVERGING TO THE PERIODIC RAY; 4. SOLUTIONS OF FUNCTION EQUATIONS
5. TAYLOR EXPANSION OF Tn(s+t o+r)Parabolic Dynamical Systems and Inducing; 1 Preliminaires; 2 Parabolic rational maps; QFT for Scalar Particles in External Fields on Riemannian Manifolds; 1 Introduction; 2 Invariant wave equations on Riemannnian manifolds; 3 Classical S-matrix; 4 Feynman's scattering amplitude; 5 Solvability of the equation AF = A + iAP_AF; 6 Quantum field theory in external forces; 7 Hilbert-Schmidt property on Riemannian manifolds; 8 Massless case; Existence and Born-Oppenheimer Asymptotics of the Total Scattering Cross-Section in Ion-Atom Collisions; I Introduction
II Notation assumptions and main results

Sommario/riassunto

This book is centered on the two minicourses conducted by C Liverani (Rome) and J Sjoestrand (Paris) on the return to equilibrium in classical statistical mechanics and the location of quantum resonances via semiclassical analysis, respectively. The other contributions cover related topics of classical and quantum mechanics, such as scattering theory, classical and quantum statistical mechanics, dynamical localization, quantum chaos, ergodic theory and KAM techniques. Contents: Return to Equilibrium in Classical and Quantum Systems (C Liverani); Quantum Resonances and Trapped Trajectories (J S