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Nota di contenuto	Intro -- Preface -- Contents -- 1 Introduction -- 1.1 Perturbation Problems -- 1.2 Amplitude-Phase Transformation -- 1.3 Comoving Varables -- 1.4 Amplitude-Angle Transformation -- 1.5 Perturbed Linear Systems and Forcing -- 1.6 Order Functions and Timescales -- 1.7 On Contraction and Iteration Approximations -- 1.8 Comparison of Methods -- 1.9 Analytic and Numerical Approximations -- 2 First Order Periodic Averaging -- 2.1 The Basic Averaging Theorem -- 2.2 Quasi-Periodic Averaging -- 2.3 Applications -- 2.3.1 A Linear Example with Forcing -- 2.3.2 The Van der Pol-Equation -- 2.3.3 Averaging Autonomous Equations -- 2.3.4 A Generalised Van der Pol-Equation -- 2.3.5 The Mathieu-Equation with Damping -- 2.3.6 The Forced Duffing-Equation Without Damping -- 2.3.7 Nonlinear Damping -- 2.3.8 A Hamiltonian System with Cubic Term -- 2.3.9 The Spring-Pendulum -- 3 Periodic Solutions -- 3.1 Periodic Solutions -- 3.2 Applications -- 3.2.1 A First Order Equation -- 3.2.2 A Generalised Van der Pol-Equation -- 3.2.3 The Duffing-Equation with Small Forcing --

3.2.4 The Nonlinear Mathieu-Equation -- 3.2.5 The Mathieu-Equation with Damping -- 3.2.6 Models for Autoparametric Energy Absorption -- 3.3 The Poincaré-Lindstedt Method -- 3.3.1 General Approach for Variational Systems -- 3.3.2 The Poincaré-Lindstedt Approach for Autonomous Systems -- 3.3.3 The Poincaré-Lindstedt Approach for Non-autonomous Systems -- 3.4 Applications of the Poincaré-Lindstedt Method -- 3.4.1 The Periodic Solution of the Van der Pol-Equation -- 3.4.2 A Case of Non-uniqueness -- 3.4.3 The Mathieu-Equation -- 4 Second Order Periodic Averaging -- 4.1 Second Order Precision -- 4.2 Applications -- 4.2.1 Simple Conservative Systems -- 4.2.2 Van der Pol-Excitation at 2nd Order -- 4.2.3 Intermezzo on the Nature of Timescales -- 4.2.4 The Chaotic Systems Sprott A and NE8.
5 First Order General Averaging -- 5.1 The Basic Theorem for General Averaging -- 5.2 Second Order General Averaging -- 5.3 Applications -- 5.3.1 Van der Pol-Equation with Changing Friction -- 5.3.2 Linear Oscillations with Increasing Friction, Adiabatic Invariant -- 5.3.3 Quasi-Periodic Forcing of the Duffing-Equation -- 5.3.4 Quasi-Periodic Forcing of a Van der Pol Limit Cycle -- 5.3.5 Evolution to Symmetry, Adiabatic Invariants -- 6 Approximations on Timescales Longer than 1/ -- 6.1 When First Order Periodic Averaging Produces Trivial Results -- 6.2 The Case of Attraction -- 6.3 Applications -- 6.3.1 Excitation Frequency =1 for the Mathieu-Equation -- 6.3.2 A Cubic Hamiltonian System in 1:1 Resonance -- 6.3.3 The Amplitude of Periodic Solutions of Autonomous Equations -- 6.3.4 The Damped Duffing Equation with O(1) Forcing -- 7 Averaging over Spatial Variables -- 7.1 Averaging over One Angle -- 7.2 Averaging over More Angles -- 7.3 Applications -- 7.3.1 A Pendulum with Slow Time Frequency Variation -- 7.3.2 A Typical Problem with One Resonance Manifold -- 7.3.3 Behaviour in a Resonance Manifold -- 7.3.4 A 3-Dimensional System with 2 Angles -- 7.3.5 Intersection of Resonance Manifolds -- 7.3.6 A Rotating Flywheel on an Elastic Foundation -- 8 Hamiltonian Resonances -- 8.1 Frequencies and Resonances in the Hamiltonian Case -- 8.2 Higher Order Resonance in 2 Degrees-of-Freedom -- 8.3 The Poincaré Recurrence Theorem -- 8.4 Applications -- 8.4.1 A General Cubic Potential -- 8.4.2 A Cubic Potential in Higher Order Resonance -- 8.4.3 The Spring-Pendulum in Higher Order Resonance -- 8.4.4 Three dof, the 1:2:1 Resonance -- 8.4.5 The Fermi-Pasta-Ulam Chain -- 8.4.6 Interaction of Low and Higher Order, the 2:2:3 Resonance -- 8.4.7 Interaction of Low and Higher Order, the 1:1:4 Resonance -- 9 Quasi-Periodic Solutions and Tori.
9.1 Tori by Bogoliubov-Mitropolsky-Hale Continuation -- 9.2 The Case of Parallel Flow -- 9.3 Tori Created by Neimark-Sacker Bifurcation -- 9.4 Applications -- 9.4.1 A Forced Van der Pol-Oscillator -- 9.4.2 Quasi-Periodic Solutions in the Forced Van der Pol-Equation -- 9.4.3 Neimark-Sacker Bifurcation in Two Coupled Oscillators -- 9.4.4 Interaction of Vibrations and Parametric Excitation -- 9.4.5 Interaction of Self-Excited and Parametric Excitation -- 9.4.6 Interaction of Self-Excited Oscillations (Hale's Example) -- 9.5 Iteration by Integral Equations -- 9.6 Applications of the Iteration Procedure -- 9.6.1 Hale's Example by Iteration -- 9.6.2 Two Coupled Oscillators with Forcing -- 9.6.3 Iteration of the Cartoon Problem -- 10 Averaging for Partial Differential Equations -- 10.1 Metric Spaces and Norms, a Reminder -- 10.2 Averaging a Linear Operator -- 10.3 Wave Equations, Projection Methods -- 10.4 Applications -- 10.4.1 Application to a Time-Periodic Advection-Diffusion Problem -- 10.4.2 Advection-Diffusion with Reactions and Sources -- 10.4.3 The Wave Equation with Cubic Nonlinearity -- 10.4.4 A 1-Dimensional Dispersive, Cubic Klein-Gordon Equation -- 10.4.5 The Cubic Klein-Gordon Equation on a

Square -- 10.4.6 The Keller-Kogelman Problem -- 10.4.7 A Parametrically Excited Linear Wave Equation -- 10.4.8 Parametrical Excitation of Nonlinear Waves -- 10.4.9 Parametrical Excitation of 2-Dimensional Nonlinear Waves -- References -- Index.

Sommario/riassunto

This primer on averaging theorems provides a practical toolbox for applied mathematicians, physicists, and engineers seeking to apply the well-known mathematical theory to real-world problems. With a focus on practical applications, the book introduces new approaches to dissipative and Hamiltonian resonances and approximations on timescales longer than 1/. Accessible and clearly written, the book includes numerous examples ranging from elementary to complex, making it an excellent basic reference for anyone interested in the subject. The prerequisites have been kept to a minimum, requiring only a working knowledge of calculus and ordinary and partial differential equations (ODEs and PDEs). In addition to serving as a valuable reference for practitioners, the book could also be used as a reading guide for a mathematics seminar on averaging methods. Whether you're an engineer, scientist, or mathematician, this book offers a wealth of practical tools and theoretical insights to help you tackle a range of mathematical problems.