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Nota di contenuto	Preface; CONTENTS; Part A Classical Hamiltonian Dynamics; Resonant interaction of charged particles with electromagnetic waves A. A. Vasiliev, A. V. Artemyev, A. I. Neishtadt, D. L. Vainchtein and L. M. Zelenyi; 1. Introduction; 2. Main equations; 3. Single wave (non-relativistic case); 3.1. Normal propagation; 3.2. Oblique propagation; 4. Effects of the second wave; 4.1. Parallel propagation; 4.2. Nonparallel propagation; 5. Relativistic case; 6. Discussion and conclusions; Acknowledgments; References Superrelativistic charged particles acceleration by electromagnetic waves: Self-consistent model A. V. Artemyev, L. M. Zelenyi, and V. L. Krasovsky1. Introduction; 2. Wave-particle interaction; 3. Self-consistent approach; 4. Discussion and conclusions; Acknowledgments; References; Control of atomic transport using autoresonance D. V. Makarov, M. Yu. Uleysky and S. V. Prants; 1. Introduction; 2. Basic equations; 3. Classical dynamics; 4. Numerical simulation; 4.1. Classical autoresonance; 4.2. Quantum autoresonance; 5. Conclusion; Acknowledgments; References

Lagrangian tools to monitor chaotic transport and mixing in the ocean
 S. V. Prants, M. V. Budyansky and M. Yu. Uleysky
 1. Introduction; 2. Lagrangian and dynamical systems methods to study transport and mixing in the ocean; 3. Transport and mixing in marine bays; 4. Transport and mixing in the Kuroshio Extension region; 5. Conclusion; References;
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 2.2. From Kramers-Moyal expansion to the Fokker-Planck equation
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 5.1. Averaging the Fokker-Planck equation; 5.2. Destruction of the inner structure; 6. Conclusion; References;
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 Part B Nonlinear and Quantum Physics; Nonlinear kinetic modeling of stimulated Raman scattering in a plasma
 D. Benisti; 1. Introduction; 2. Collisionless dissipation beyond Landau damping; 3. Self-optimization of stimulated Raman scattering; 4. Derivation of Raman reflectivity using an envelope code; 5. Conclusion; References;
 Occurrence of mixed-mode oscillations in a dusty plasma
 M. Mikikian, H. Tawidian, T. Lecas and O. Vallee; 1. Introduction; 2. Instabilities in dusty plasmas; 3. Mixed-Mode Oscillations; 4. Evidence of MMOs in dusty plasmas; 5. State transition
 6. State alternation

Sommario/riassunto

The main goal is to offer readers a panorama of recent progress in nonlinear physics, complexity and transport with attractive chapters readable by a broad audience. It allows readers to gain an insight into these active fields of research and notably promotes the interdisciplinary studies from mathematics to experimental physics. To reach this aim, the book collects a selection of contributions to the CCT11 conference (Marseille, 23 - 27 May 2011).
