

# **Chaos and Dynamics of Rays in Waveguide Media**

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# Chaos And Dynamics Of Rays In Waveguide Media

**David Kirk**



## **Chaos And Dynamics Of Rays In Waveguide Media:**

**Chaos and Dynamics of Rays in Waveguide Media** Sadrilla S. Abdullaev, 1993 This unique and timely work is devoted to the problems of ray theory of long range wave propagation in regularly inhomogeneous media using the modern theory of dynamic systems The author updating an old field with modern methods uses the general concepts of ray dynamics and some fairly simple notions of nonlinear dynamics to define the subject making the reading easy for even non specialists The essential ideas are initially formulated with waveguides and resonators after which the more complicated problems of nonlinear ray dynamics in mobile and heterogeneous media are discussed This original material encompasses such concepts as nonlinear resonance chaos the devil's ladder and kinetics S S Abdullaev is at the Institute for Biocybernetics Uzbekistan Academy of Sciences Tashkent He has been specialising in the theory of wave propagation since 1975 *Ray and Wave*

*Chaos in Ocean Acoustics* Denis Makarov, 2010 A systematic study of chaotic ray dynamics in underwater acoustic waveguides began in the mid 1990s when it was realized that this factor plays a crucial role in long range sound propagation in the ocean The phenomenon of ray chaos and its manifestation at a finite wavelength wave chaos have been investigated by combining methods from the theory of wave propagation and the theory of dynamical and quantum chaos This book is the first monograph summarizing results obtained in this field Emphasis is made on the exploration of ray and modal structures of the wave field in an idealized environmental model with periodic range dependence and in a more realistic model with sound speed fluctuations induced by random internal waves The book is intended for acousticians investigating the long range sound transmission through the fluctuating ocean and also for researchers studying waveguide propagation in other media It will be of major interest to scientists working in the field of dynamical and quantum chaos

**Construction of Mappings for Hamiltonian Systems and Their Applications** Sadrilla S. Abdullaev, 2006-08-02 Based on the method of canonical transformation of variables and the classical perturbation theory this innovative book treats the systematic theory of symplectic mappings for Hamiltonian systems and its application to the study of the dynamics and chaos of various physical problems described by Hamiltonian systems It develops a new mathematically rigorous method to construct symplectic mappings which replaces the dynamics of continuous Hamiltonian systems by the discrete ones Applications of the mapping methods encompass the chaos theory in non twist and non smooth dynamical systems the structure and chaotic transport in the stochastic layer the magnetic field lines in magnetically confinement devices of plasmas ray dynamics in waveguides etc The book is intended for postgraduate students and researches physicists and astronomers working in the areas of plasma physics hydrodynamics celestial mechanics dynamical astronomy and accelerator physics It should also be useful for applied mathematicians involved in analytical and numerical studies of dynamical systems *Treatise on Geophysics*, 2015-04-17 *Treatise on Geophysics* Second Edition is a comprehensive and in depth study of the physics of the Earth beyond what any geophysics text has provided previously Thoroughly revised and updated it provides fundamental and

state of the art discussion of all aspects of geophysics A highlight of the second edition is a new volume on Near Surface Geophysics that discusses the role of geophysics in the exploitation and conservation of natural resources and the assessment of degradation of natural systems by pollution Additional features include new material in the Planets and Moon Mantle Dynamics Core Dynamics Crustal and Lithosphere Dynamics Evolution of the Earth and Geodesy volumes New material is also presented on the uses of Earth gravity measurements This title is essential for professionals researchers professors and advanced undergraduate and graduate students in the fields of Geophysics and Earth system science Comprehensive and detailed coverage of all aspects of geophysics Fundamental and state of the art discussions of all research topics Integration of topics into a coherent whole      **Seismology and Structure of the Earth** Barbara Romanowicz,Adam

Dziewonski,2010-04-20 Treatise on Geophysics Seismology and Structure of the Earth Volume 1 provides a comprehensive review of the state of knowledge on the Earths structure and earthquakes It addresses various aspects of structural seismology and its applications to other fields of Earth sciences The book is organized into four parts The first part principally covers theoretical developments and seismic data analysis techniques from the end of the nineteenth century until the present with the main emphasis on the development of instrumentation and its deployment The second part reviews the status of knowledge on the structure of the Earths shallow layers starting with a global review of the Earth s crustal structure The third part focuses on the Earth s deep structure divided into its main units the upper mantle the transition zone and upper mantle discontinuities the D region at the base of the mantle and the Earth s core The fourth part comprises two chapters which discuss constraints on Earth structure from fields other than seismology mineral physics and geodynamics Self contained volume starts with an overview of the subject then explores each topic with in depth detail Extensive reference lists and cross references with other volumes to facilitate further research Full color figures and tables support the text and aid in understanding Content suited for both the expert and non expert      The Journal of the Acoustical Society of America Acoustical Society of America,2006

**Soviet Physics, Uspekhi** ,1991      **Treatise on Geophysics: Seismology and structure of the Earth** Gerald Schubert,2007 The Treatise on geophysics is the only comprehensive state of the art and integrated summary of the present state of geophysics Offering an array of articles from some of the top scientists around the world this 11 volume work deals with all major parts of solid Earth geophysics including a volume on the terrestrial planets and moons in our Solar System This major reference work will aid researchers advanced undergrad and graduate students as well as professionals in cutting edge research      **Whitaker's Books in Print** ,1998      Nonlinear Processes in Geophysics

,2005      *Seismic Modelling of Earth Structure* E. Boschi,Göran Ekström,A. Morelli,Istituto nazionale di geofisica (Italy),1996      *The Cumulative Book Index* ,1994 A world list of books in the English language      Physics Briefs ,1994      Forthcoming Books Rose Arny,1996-06      Profiles in Excellence John L. Pellam,2004      Expanded Abstracts with Biographies ,2001

**Optics and Spectroscopy** ,1995      **Physics, Uspekhi** ,1995      *Акустический журнал* ,2005 Russian academic

journal in the field of acoustics The journal publishes scientific reviews original papers short communications letters to the editor and current events It covers theoretical and experimental aspects of physical technical and biological acoustics This journal presents results of research conducted at the institutes of the Russian Academy of Sciences and at universities and research establishments in Russia and abroad      *Physical Review* ,1999-02 Publishes papers that report results of research in statistical physics plasmas fluids and related interdisciplinary topics There are sections on 1 methods of statistical physics 2 classical fluids 3 liquid crystals 4 diffusion limited aggregation and dendritic growth 5 biological physics 6 plasma physics 7 physics of beams 8 classical physics including nonlinear media and 9 computational physics

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