

《海岸水域表面波动力学》

图书基本信息

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前言

Wave motion surrounds us—from the most secret, profound waves of quantum mechanics to the grand waves of the ocean surface. Ocean waves, or water waves, may be divided into deep- and shallow- water (coastal) waves. From an advance point of view, coastal waves are not studied as thoroughly as deep-water waves due to a complicated seabed topography on the former but not on the latter. Therefore, in conjunction with the effects of ubiquitous ambient currents, wave-current-bottom interactions make up the most fundamental, widespread dynamical mechanism in coastal waters manifesting itself as refraction, diffraction, scattering, and resonant wave interactions involved in energy exchanges. Apparently, it is essential to obtain a full, clear explanation and description of coastal waves for the development of broad offshore, coastal and harbor engineering, and also for having a better understanding of the evolutionary mechanism of deep-water waves. In fact, a commanding view on long-term investigating water waves is to wholly and uniformly treat and describe deep- and shallow-water waves, thus promoting the present rapid exploration and development of global oil and gas fields in deep waters of the oceans. The aforementioned views, ideas, judgments, all that I have thought and done over the last ten years, were compiled by me in this book. The book consists of nine chapters and appendices from A to H, depicting the fundamental paradigms of weakly nonlinear water waves.

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内容概要

《海岸水域表面波动力学(波-流-海底相互作用)(英文)》内容简介：Wave motion is one of the broadest scientific subjects in nature, especially water waves in the near-shore region which present more richness and complexity of variability with respect to deep-water waves. Dynamics of Surface Waves in Coastal Waters: Wave-Current-Bottom Interactions develops the typical basic theories (e.g. mild-slope equation and shore-crested waves) and applications of water wave propagation with an emphasis on wave-current-bottom interactions and Hamiltonian systems. In recent times, the interest in water wave propagation has accelerated because of rapid developments in global coastal ocean engineering. This book lays a new foundation for coastal ocean engineering and includes numerous theories and concepts (generalized wave actions in particular), making it beneficial to physical oceanographers and engineers. The book has detailed illustrations and stimulating examples showing how the theory works, and up-to-date techniques, all of which make it accessible to a wide variety of readers, especially senior undergraduate and graduate students in fluid mechanics, coastal and ocean engineering, physical oceanography and applied mathematics.

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章节摘录

插图：The third term can be called the bottom wave action, a positive compensation by including the effects of moving bottoms and describing a widespread dynamic process occurring on the nearshore bottoms (such as coastal evolution and sand-wave migrations) . The fourth term may be considered as the dissipation wave action, transmitting a full scale effect of the dissipation arising from the origin in the viscosity of fluid, determining its nonnegligible dissipative function of the complete equation system, and probably having a widespread value of application. Finally the fifth term vanishes identically [2]. Therefore it can be seen that these four kinds of wave actions on the left of equation (7.4.2) reach mutually a more general form of integration with complement, compatibility and distinction. Bretherton and Garrett [2] had shown the equivalence of equation (7.4.1) for many other types of wave motion in fluid dynamics, so that, (7.4.2) can be regarded as a valuable extension of (7.4.1) , giving rise to a generalized wave action equation for the dissipative dynamical system in the nearshore region, which will play an important role in dealing with the process of real viscous flow.

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编辑推荐

《海岸水域表面波动力学(波-流-海底相互作用)(英文)》是由高等教育出版社出版的。

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精彩短评

- 1、理论性较强，但此方面太精深了，作为参考可。
- 2、原先以为是老外的文章翻译成中文出版的，但实际是中国人的文章翻译成英语了。书里很多公式。有一定难度。

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