《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 quantummechanics 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 asthoroughly as deep-water waves due to a complicated seabed topography on theformer but not on the latter. Therefore, in conjunction with the effects of ubiqui-tous ambient currents, wave-current-bottom interactions make up the most fun-damental, widespread dynamical mechanism in coastal waters manifesting itselfas refraction, diffraction, scattering, and resonant wave interactions involved inenergy exchanges.Apparently, it is essential to obtain a full, clear explanation and descriptionof coastal waves for the development of broad offshore, coastal and harbor en-gineering, and also for having a better understanding of the evolutionary mech-anism of deep-water waves. In fact, a commanding view on long-term inves-tigating water waves is to wholly and uniformly treat and describe deep- andshallow-water waves, thus promoting the present rapid exploration and devel-opment of global oil and gas fields in deep waters of the oceans.The aforementioned views, ideas, judgments, all that I have thought and doneover the last ten years, were compiled by me in this book. The book consists ofnine chapters and appendices from A to H, depicting the fundamental paradigmsof 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, especiallywater waves in the near-shore region which present more richness andcomplexity of variability with respect to deep-water waves. Dynamicsof Surface Waves in Coastal Waters Wave-Current-Bottom Interactionsdevelops the typical basic theories （e.g. mild-slope equation and shore-crested waves） and applications of water wave propagation with an emphasison wave-current-bottom interactions and Hamiltonian systems. In recenttimes, the interest in water wave propagation has accelerated because ofrapid developments in global coastal ocean engineering.
This book lays a new foundation for coastal ocean engineering and includesnumerous theories and concepts （generalized wave actions in particular）,making it beneficial to physical oceanographers and engineers. The bookhas detailed illustrations and stimulating examples showing how the theoryworks, and up-to-date techniques, all of which make it accessible to a widevariety of readers, especially senior undergraduate and graduate studentsin fluid mechanics, coastal and ocean engineering, physical oceanographyand applied mathematics.

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书籍目录

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章节摘录

插图：The third term can be called the bottom wave action, a positive compensation byincluding the effects of moving bottoms and describing a widespread dynamicprocess occurring on the nearshore bottoms （such as coastal evolution and sand-wave migrations）. The fourth term may be considered as the dissipation waveaction, transmitting a full scale effect of the dissipation arising from the originin the viscosity of fluid, determining its nonnegligible dissipative function of thecomplete equation system, and probably having a widespread value of applica-tion. Finally the fifth term vanishes identically [2]. Therefore it can be seen thatthese four kinds of wave actions on the left of equation （7.4.2） reach mutuallya more general form of integration with complement, compatibility and distinc-tion. 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 beregarded as a valuable extension of （7.4.1）, giving rise to a generalized waveaction equation for the dissipative dynamical system in the nearshore region,which will play an important role in dealing with the process of real viscousflow.

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编辑推荐

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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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