PREFACE TO THE REVIEW SERIES

The rapid flow of new literature has confronted scientists and engineers of all branches with a very acute dilemma: How to keep up with new knowledge without becoming too narrowly specialized. Collections of review articles covering broad sectors of science and engineering are still the best way of sifting new knowledge critically. Comprehensive review articles written by discerning scientists and engineers not only separate lasting knowledge from the ephemeral, but also serve as guides to the literature and as stimuli to thought and to future research.

The aim of this review series is to present critical commentaries of the state-of-the-art knowledge in the field of coastal and ocean engineering. Each article will review and illuminate the development of scientific understanding of a specific engineering topic. Our plans for this series include articles on sediment transport, ocean waves, coastal and offshore structures, air-sea interactions, engineering materials, and seafloor dynamics. Critical reviews on engineering designs and practices in different countries will also be included.

P. L.-F. Liu

PREFACE TO THE SEVENTH VOLUME

This volume consists of five papers covering a wide range of topics in coastal oceanographic engineering. Drs. Maarten Dingemans and Ashwini Otta prepare the first paper on the subject of "Nonlinear Modulation of Water Waves". This comprehensive review article starts with several illustrative sections to guide readers to the nonlinear wave processes in deep and intermediate water. The Nonlinear cubic Schrödinger (NLS) equations are then presented and discussed for both deepwater and varying water depth with or without an ambient current. Discussions are extended to higher-order modulation equations, such as Dysthe's equation and the Zakharov's equation. Derived from the Hamiltonian principle, the Zakharov's equation provides a broader basis for higher-order equations. Drs. Dingemans and Otta point out the importance of including the formulations of dissipation due to breaking in the modulation equations. Several experiments have suggested that the frequency downshift could be a rather sudden process associated with wave breaking.

The second paper is entitled "Bubble Measurement Techniques and Bubble Dynamics in Coastal Shallow Water". Both authors, Drs. Ming-Yang Su and Joel Wesson, are experts in field measurements and instrumentations. In particular, they have been involved in studying bubble dynamics in deepwater waves and in coastal shallow water waves for more than fifteen years. In this paper, they first give a comprehensive review of various sensors for measuring physical parameters of the bubble field generated by wave breaking and the corresponding deployment methods for some of these sensors in the coastal water. These sensors are based on the optical, acoustical, and electromagnetic principles. Several field experiments are used to illustrate the functionality of these sensors. Based on their experience in the field experiments, Drs. Su and Wesson give an insightful account of dynamical and statistical features of wave breaking and bubble field in the nearshore environment.

Drs. Panchang and Demirbilek present the third review paper, entitled "Simulation of Waves in Harbors Using Two-Dimensional Elliptic Equation Models". They provide a comprehensive review of mathematical modeling procedures developed in recent years in the area of elliptic wave equations, which

are suitable for simulating wave agitations and resonance in ports and harbors. Modeling techniques and extensions of the linear mild-slope equation to include steep slope, realistic boundary conditions, and dissipative mechanisms such as wave breaking and bottom friction; wave-wave and wave-current interactions are discussed. Several practical applications are demonstrated.

The fourth paper is written by Dr. Losada and is entitled "Recent Advances in the Modeling of Wave and Permeable Structure Interaction". This paper focuses on the theoretical development of various mathematical models for wave and structure interactions. The structure could be impermeable and permeable. In the case of permeable structures, the determination of empirical coefficients characterizing the porous materials is discussed. The paper also reviews the state of arts wave models based on the Reynolds Averaged Navier Stokes equations. The volume of fluid method is used in the model to trace the free surface location so that wave-breaking process can be simulated.

In the last paper Drs. Harry Yeh and Kiyoshi Wada report their laboratory observations on lock exchange flows. The Laser-Induced Fluorescent-dye technique is used to examine the qualitative characteristics and behaviors of gravity currents and internal bores. The similarity and dissimilarity between gravity flows and internal bores are discussed based on vortex dynamics.

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