

Watanabe

## Dynamics of Water Surface Flows and Waves

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Dynamics of Water Surface Flows and Waves provides theoretical descriptions of the whole life of water surface waves through their birth, propagation, evolution and finally breaking. While initial capillary waves are created via instability at air-water interfaces, potential wave theories adequately describe interactions of waves with current, bathymetry and structure. In the final breaking stage, potential fluid motions in the waves rapidly evolve into vortical turbulent flows that disturb the surfaces, resulting in entrainment of air-bubbles and ejection of sea spray in bursting bubbles floating on the surface. All theories and analytical methods required to understand the series of wave processes, over diverse areas of subjects, including turbulence, diffusion, vortex and capillary dynamics, shallow water approach, and stability analysis, as well as the conventional potential wave theory, are comprehensively covered in this book. All of the mathematical formulas are consistently developed from theorems and linked with physics, which provides theoretical understanding and further interest in wave dynamics. This is an ideal graduate-level textbook or reference for engineers and researchers in the fields of fluid and wave mechanics, coastal and ocean engineering.



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**Kundenservice Fachmedien Otto Schmidt**

Neumannstraße 10, 40235 Düsseldorf | [kundenservice@fachmedien.de](mailto:kundenservice@fachmedien.de) | 0800 000-1637 (Inland)

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