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4.8 Forces resulting from breaking-wave impactREFERENCES; Chapter 5. Mathematical and numerical treatment of flow around a cylinder; 5.1 Direct solutions of Navier-Stokes equations; 5.1.1 Governing equations; 5.1.2 The Oseen (1910) and Lamb (1911) solution; 5.1.3 Numerical solutions; 5.1.4 Application to oscillatory flow; 5.2 Discrete vortex methods; 5.2.1 Numerical simulation of vorticity transport; 5.2.2 Procedure used in the implementation of discrete vortex method; 5.2.3 Application areas; 5.3 Hydrodynamic stability approach; REFERENCES Chapter 6. Diffraction effect. Forces on large bodies6.1 Vertical circular cylinder; 6.1.1 Analytical solution for potential flow around a vertical circular cylinder; 6.1.2 Total force on unit-height of cylinder; 6.1.3 Total force over the depth and the overturning moment; 6.2 Horizontal circular cylinder near or on the seabottom. Pipelines; REFERENCES; Chapter 7. Forces on a cylinder in irregular waves; 7.1 Statistical treatment of irregular waves; 7.1.1 Statistical properties of surface elevation; 7.1.2 Statistical properties of wave height; 7.1.3 Statistical properties of wave period
7.1.4 Long-term wave statistics

Sommario/riassunto

This book discusses the subject of wave/current flow around a cylinder, the forces induced on the cylinder by the flow, and the vibration pattern of slender structures in a marine environment. The primary aim of the book is to describe the flow pattern and the resulting load which develops when waves or current meet a cylinder. Attention is paid to the special case of a circular cylinder. The development in the forces is related to the various flow patterns and is discussed in detail. Regular as well as irregular waves are considered, and special cases like wall proximities (pipelines) are also investigated. The book is intended for MSc students with some experience in basic fluid mechanics and for PhD students.