1. Record Nr. UNISALENTO991003223619707536

Autore	Bertram, Volker
Titolo	Practical ship hydrodynamics [e-book] / Volker Bertram
Pubbl/distr/stampa	Oxford ; Boston : Butterworth-Heinemann, 2000
ISBN	9780750648516 0750648511
Descrizione fisica	x, 270 p. : ill. ; 24 cm
Disciplina	623.812
Soggetti	Ships - Hydrodynamics Electronic books.
Lingua di pubblicazione	Inglese
Formato	Risorsa elettronica
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references (p. 265-268) and index
Nota di contenuto	Introduction; Overview of problems and approaches; Model test and similarity laws; Full scale tests; Numerical approaches (Computational Fluid Dynamics); Basic equations, Basic techniques; Applications. Propeller Flows: Propeller geometry and other basics, Propeller curves; Numerical methods for propeller design; Lifting line theory; Lifting surface theory; BEM for propellers; Field methods; Cavitation; Experimental approach; Propeller design procedure. Resistance and propulsion: Resistance and propulsion concepts; Interaction between ship and propeller; Decomposition of resistance; Experimental approach; Towing tanks and experimental set up; Resistance test; Method ITTC 1957; Method of Hughes-Prohaska; Propulsion test; Additional resistance under service conditions; Simple design approaches; CFD approaches for steady flow; Wave resistance computations; Viscous flow computations; Problems for fast and unconventional ships. Ship Seakeeping: Introduction to seakeeping; Experimental approaches (model and full-scale); Waves and seaway; Airy waves (harmonic waves of small amplitude); Natural seaway; Wind and seaway; Wave climate; Numerical prediction of ship seakeeping; Overview of computational methods; Strip method; Rankine panel methods; Problems for fast and unconventional ships; Further quantities in regular waves; Ship responses in stationary seaway; Simulation methods; Long-term distributions; Slamming. Manoeuvring:

Simulation of manoeuvring with known coefficients; Coordinate systems and definitions; Body forces and manoeuvring motions; Linear motion equations; CFD for manoeuvring; Experimental approaches; Manoeuvring tests for full-scale ships in sea trials; Model tests; Rudders; Computation of body forces; Slender-body theory; Influence of heel; Shallow-water effect; Jet thrusters; Stop manoeuvres. Boundary element methods: Green function formulation; Integral equations; Source elements; Point source; Regular first-order panel; Jensen panel; Higher-order panel; Vortex elements; Dipole elements; Point dipole. Numerical examples for BEM: Two-dimensional body in infinite flow; Theory; Numerical implementation.

Sommario/riassunto

The author has provided the reader with comprehensive coverage of ship hydrodynamics with a focus on numerical methods now in use. The book provides a global overview of experimental and numerical methods for ship resistance and propulsion, manoeuvring and seakeeping. As boundary element techniques are now in standard use, these are covered in sufficient detail for independent code development. The book is divided into seven chapters. Chapter one contains an overview of problems and approaches, including the basics of model and full scale testing. An introduction to computational fluid dynamics is given, including a discussion of applications. The next four chapters cover the subjects: propellers, resistance and propulsion, seakeeping and manoeuvring. These chapters present basic methods, such as model testing, extrapolation to full scale, and procedures for design. Substantial parts of each chapter include numerical methods and their applications. The last two chapters are devoted to boundary element methods for resistance and seakeeping. Web-supported text. Questions provided in chapters with answers on the web Covers well-established methods as well as the newest numerical procedures in the area of ship hydrodynamics