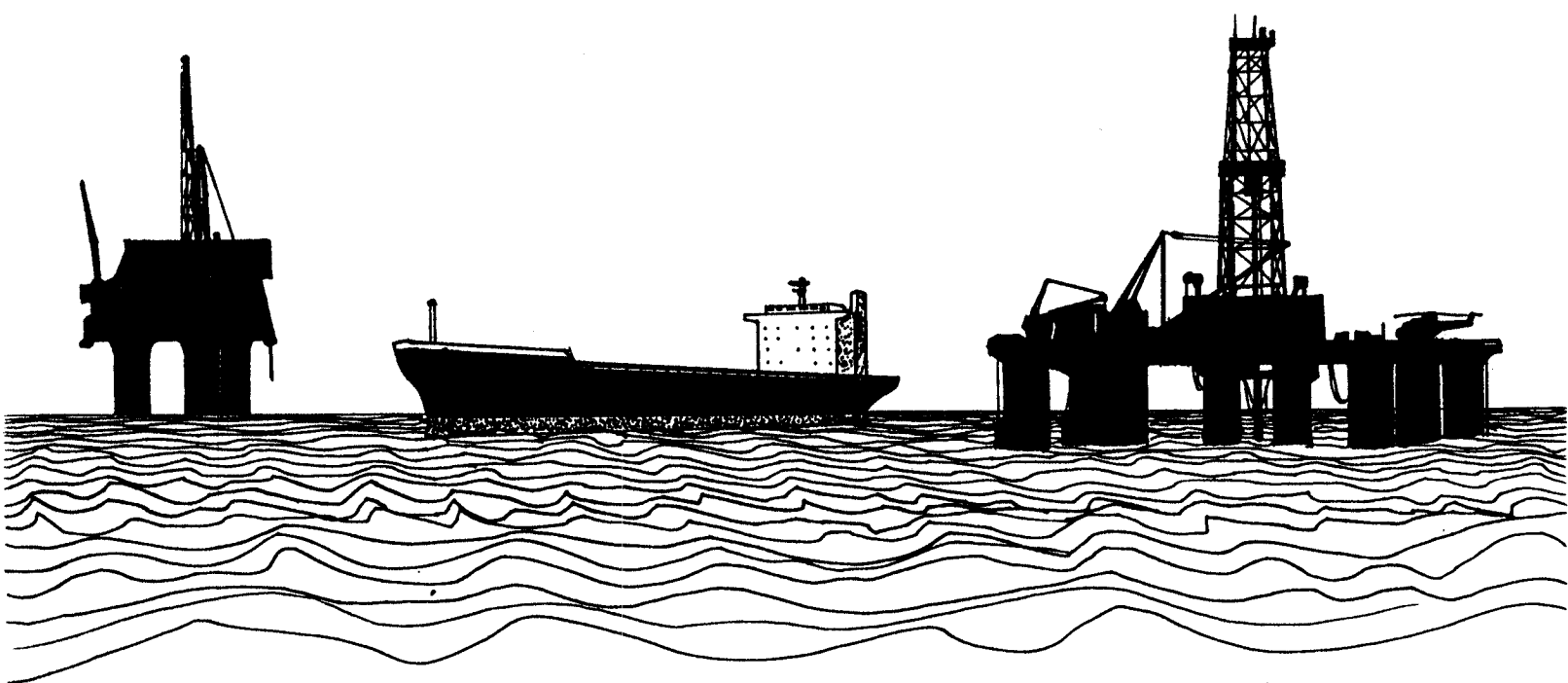


THE THIRD  
INTERNATIONAL WORKSHOP  
ON WATER WAVES  
AND FLOATING BODIES

Woods Hole, Massachusetts

April 10 - 13, 1988



**THE THIRD INTERNATIONAL WORKSHOP**  
on  
**WATER WAVES AND FLOATING BODIES**

F. T. Korsmeyer, Editor

Report 88-4

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**ABSTRACT**

A workshop was held at Swope Center, Woods Hole Oceanographic Institute on 10-13 April 1988 for specialists performing theoretical research on the interactions of water waves with floating or submerged bodies. This report contains extended abstracts of the presentations and summaries of the discussions.

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## INTRODUCTION

The Third International Workshop on Water Waves and Floating Bodies was held at the Swope Center, Woods Hole, Mass., USA from 10-13 April 1988. This report contains abstracts of the presentations at the Workshop, together with the recorded discussions. The abstracts are arranged in alphabetical order of the first-named author. Also included is a list of titles and authors, and a list of the participants' names and addresses.

In addition to the 39 papers accepted for presentation at the regular sessions, three special evening sessions were held. On the first evening John Valois, of the Marine Biological Laboratory at Woods Hole, described the history of Woods Hole and some of its scientific activities. At the second evening session, on parallel computation and free-surface hydrodynamics, two talks were presented by Ray Chin and Steven Breit. Chin discussed the use of parallel processors in conjunction with asymptotic analysis based on domain decomposition. Breit compared different types of parallel processors and assessed their relative merits particularly in the context of the solution of boundary integral equations by panel methods. At the third evening session Art Reed summarized the results of the workshop on ship waves held at DTRC in January. Following the Workshop a visit was made by many participants to the Woods Hole Oceanographic Institute Deep Submergence Laboratory, where the development and testing of robotic submarine vehicles was described.

Financial support for the Third Workshop was provided by the U.S. National Science Foundation, Division of Emerging Engineering Technology. The organizers and participants are grateful to NSF for its support of this Workshop as well as of the First Workshop, held at MIT in February 1986, and to the British Marine Technology Directorate, Ltd., for support of the Second Workshop held in Bristol, UK, in March 1987. This continuing support has been most helpful in providing travel assistance to participants who could not otherwise have attended, and particularly in facilitating the attendance of students and younger workers.

The number of submitted abstracts has grown each year, and it has become necessary to select from among a substantially larger number than could be accommodated in the three-day program. Difficult as this task was for us and for the rejected authors, it is nonetheless a positive indication that the Workshops are successful. The enthusiasm and cooperation of the participants is gratifying, and we also note the increased rate of progress which has followed in certain areas during the past two years. An example is the second-order theory, where extensive discussions at the First Workshop of the appropriate radiation condition have been followed two years later by complete solutions for idealized bodies. The Third Workshop also was notable for increased attention to ship waves, a classical subject which continues to impress us with its difficulty.

Copies of the First Workshop Report are available from Professor Newman (\$10 including surface post) and copies of the Second Workshop Report are available, from Professor Evans (£5 including surface post).

Preliminary plans are being made to hold the Fourth Workshop in Norway, in May 1989. Final arrangements and details will be announced by the hosts.

Professor D. V. Evans  
Dept. of Mathematics  
University of Bristol

Professor J. N. Newman  
Dept. of Ocean Engineering  
MIT Room 5-324

## LIST OF PRESENTATIONS

- |  |  |
|--|--|
| Vidar Aanesland<br>MARINTEK - Trondheim, Norway                        | A Three-Dimensional Panel Method<br>for Calculating Wave-Making  |
| Sam Ando and D. Cumming<br>Defence Res. Establishment Atlantic         | Some Important Discrepancies Between<br>Slender-Body Theory and Experiment<br>in the Diffraction Problem     |
| Subrata K. Chakrabarti<br>CBI Research Corporation                     | Wave Interaction with a Semicircular<br>Shell Near Bottom Boundary   |
| F. P. Chau and R. Eatock Taylor<br>London Centre for Marine Technology | Second Order Velocity Potential for<br>Arbitrary Bodies in Waves   |
| Raymond Cointe<br>Institut Francais du Petrole                         | Remarks on the numerical treatment of the inter-<br>section point between a rigid body and a free<br>surface |
| Mark Cooker and Howell Peregrine<br>Bristol                            | Solitary Waves Passing over Submerged<br>Breakwaters   |
| D.G. Dommermuth and D.K.P. Yue, MIT                                    | A High-Order Equation for Shallow-Water Waves  |
| D. V. Evans, Bristol   | Edge Waves Over a Sloping Beach  |
| P. Ferrant<br>Laboratoire d'Hydrodynamique Navale                      | An accelerated computational method for<br>Time-Domain Analysis of 3D Wave-Body Interactions                 |
| Gunnar Flaten and Enok Palm, Oslo                                      | Reflection from Porous Bottom Elevations   |
| Mark Grosenbaugh and Ronald W. Yeung<br>WHOI/Berkeley                  | Nonlinear Free-Surface Flow at a Two-Dimensional<br>Bow  |
| John Grue and Knut Granlund<br>Oslo                                    | Impact of Nonlinearity upon Waves Travelling<br>over a submerged cylinder                                    |
| Dane Hendrix and Francis Noblesse<br>David Taylor Research Center      | Validation of a simple approximate method for<br>evaluating steady ship waves                                |
| G. C. Hsiao and R. E. Kleinman<br>Delaware                             | Iterative Solutions of Floating Body Integral<br>Equations   |
| R. T. Hudspeth & W. Sulisz, Oregon                                     | Mass Transport in Wave Flumes  |
| S. M. Hung and R. Eatock Taylor<br>London Center for Marine Technology | The Formulation of Mean Drift Forces and Moments<br>for Floating Bodies                                      |

Gerhard Jensen, Hamburg	Numerical Solution of the Nonlinear Ship Wave Resistance Problem
Sang W. Joo, William W. Schultz and Arthur F. Messiter, Ann Arbor	Evolution of Nonlinear Waves Due to a Moving Wall
Masashi Kashiwagi and Makoto Ohkusu Kyushu	Radiation Problem of a Two-Dimensional Surface-Piercing Body with Forward Speed
Moo-Hyun Kim and Dick K.P. Yue MIT	The Complete Sum and Difference Frequency Wave Force Quadratic Transfer Functions for an Axisymmetric Body
F. T. Korsmeyer, MIT	Details of a Panel-Method Solution to the First-Order Transient Radiation Problem
Chang-Ho Lee, MIT	Removal of irregular frequencies using the modified integral equation
C. M. Linton and D. V. Evans Bristol	Active devices for the reduction of wave intensity
A. Magee and R. F. Beck, Ann Arbor	Nonlinear Motions in the Time Domain
Paul A. Martin, Manchester	Oscillating Immersed Plates and Hypersingular Integral Equations
B. Molin and L. Boudet Institut Francais du Petrole	Second-Order Deformation of the Free-Surface Elevation around a Vertical Cylinder
Kazu-hiro Mori and Myung-soo Shin Hiroshima	Critical Condition for the Appearance of Sub-Breaking Waves and Numerical Simulation
Dimitris E. Nakos, MIT	A Quadratic Spline Scheme for the Wave Resistance Problem
J N Newman, MIT	Evaluation of the Wave-Resistance Green Function near the Singular Axis
Finn Gunnar Nielsen Norsk Hydro	Some Simplified Considerations on the Low-Frequency Motion of a Deep Draft Floating Platform
Paul D. Sclavounos, MIT	Stability Analysis of Free-Surface Panel Methods for the Wave Resistance Problem
Carl A. Scragg and John C. Talcott SAIC, San Diego	Convergence of the Neumann-Kelvin Problem

Debabrata Sen and J. S. Pawlowski  
Univ. Newfoundland, St. John's

Wu-Ting Tsai and Dick K. P. Yue  
MIT

E. O. Tuck, Adelaide

Fritz Joseph Ursell, Manchester

P. Walton, Manchester

G. Zaraphonitis and A. Papanikolaou  
Athens

Rong Zhao and Odd M. Faltinsen  
Trondheim

Two-dimensional Numerical Modelling of Large  
Motions of Floating Bodies in Steep Waves

Nonlinear Standing Waves in a Two-  
Dimensional Heaving Tank

A Strip Theory for Wave Resistance

On the Kelvin Wave-Source Potential

Short-Wave Asymptotics in Two Dimensional  
Water Wave Problems

On the calculation of the Second-Order Free-Sur-  
face Inhomogeneity for 3D Ship Motion Problems

Wave-Current Interaction Effects on Large Volume  
Structures