

Preface to the Second Edition

This book is a revision and extension of the book published by R. Timman, A.J. Hermans and G.C. Hsiao based on the lecture notes of courses presented by Timman at the University of Delaware in 1971 and by Hermans at the Technical University of Delft. The main topic of the original text is based on linearised free surface water wave theory. For many years the first edition of the book is used by Aad Hermans as material for a course in ship hydrodynamics presented to Master students in applied mathematics and naval architecture at the Technical University of Delft. Influenced by the progress in the research in water waves and especially in ship hydrodynamics the contents of the course has changed gradually. For instance in offshore engineering the topic like the low-frequency motion of objects moored to a buoy has become an important issue during this period. Therefore an introduction in this field has been added. For didactic reasons the very simple rather abstract problem of the motion of a vertical wall is added. The reason to do so is that most effects that play a role can be treated analytically, while for a general three dimensional object some terms can only be obtained numerically. The use of numerical programs is normal practice in this field, therefor an introduction in the theory of integral equations is presented and some specific problems which may arises, such how to avoid non-physical resonance at the so called irregular frequencies may be avoided. In the first edition a derivation of the structure of the equations of motion in all six degrees of freedom is presented. Because the functions derived there are not easily computed in a practical case, we restrict ourselves to the derivation of the equation of motion in one degree of freedom.

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