Wave Mechanics And Wave Loads On Marine Structures

Waves and Wave Forces on Coastal and Ocean Structures Wave Mechanics and Wave Loads on Marine Structures **Wave Mechanics and Wave Loads on Marine Structures** *Piers, Jetties and Related Structures Exposed to Waves* **Hydrodynamics of Offshore Structures** Ocean Wave Kinematics, Dynamics, and Loads on Structures Wave Forces on Models of Submerged Offshore Structures *Sea Loads on Ships and Offshore Structures* **Wave Forces on Offshore Structures Breaking wave load of a vertical slender cylinder within a cylinder group Mechanics of Wave Forces on Offshore Structures Environmental Forces on Offshore Structures and Their Prediction Wave Mechanics and Wave Loads on Marine Structures** *On the Prediction of the Extreme Value of Wave Loads Waves and Wave Forces on Coastal and Ocean Structures* Probabilistic Design Tools for Vertical Breakwaters **Analysis of Wave Forces on a 30-inch Diameter Pile Under Confused Sea Conditions** Wave Forces on Offshore Structures Comparison of methods for the computation of wave forcing A comparison of methods for computation of wave forcing **Wave Forces on a Dock** *The Statistical Distribution of Ocean Wave Forces on Vertical Piling* **Wind energy. Methods for computation of wave forcing and the resulting motion of a slender offshore floating structure** Wave Forces on Circular Piles Wave Loading on Vertical Sheet-pile Groins and Jetties An Experimental Study of Some of the Fundamental Aspects of Wave Induced Forces on Cylindrical Objects **Ocean Wave Forces on Piles Water Wave Kinematics** Analysis of Wave Forces on a 30-inch Diameter Pile Under Confused Sea Conditions Wave Loading Data from Fixed Vertical Cylinders **Wave Forces on Breakwaters Ocean Waves Engineering** *Tables of the Statistical Distribution of Ocean Wave Forces and Methods of Estimating Drag and Mass Coefficients* **Wave Forces on Piling The Statistical Distribution of Ocean Wave Forces on Vertical Piling** Wave Forces on Piles Large-scale Tests of Wave Forces on Piling Wave Forces on Rubble-mound Breakwaters and Jetties Offshore Compliant Platforms **Surface Waves and Offshore Structures**

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Sea Loads on Ships and Offshore Structures Mar 22 2022 After introducing the theory of the structural loading on ships and offshore structures based on the motions of wind, waves and currents, this text demonstrates its applications to conventional and non-conventional sea vessels, including extensive exercises and examples.

Wave Loading Data from Fixed Vertical Cylinders Apr 30 2020

Environmental Forces on Offshore Structures and Their Prediction Nov 18 2021

Wave Mechanics and Wave Loads on Marine Structures Aug 27 2022 Wave Mechanics and Wave Loads on Marine Structures provides a new perspective on the calculation of wave forces on ocean structures, unifying the deterministic and probabilistic approaches to wave theory and combining the methods used in field and experimental measurement. Presenting his quasi-determinism (QD) theory and approach of using small-scale field experiments (SSFEs), author Paolo Boccotti simplifies the findings and techniques honed in his ground-breaking work to provide engineers and researchers with practical new methods of analysis. Including numerous worked examples and case studies, Wave Mechanics and Wave Loads on Marine Structures also discusses and provides useful FORTRAN programs, including a subroutine for calculating particle velocity and acceleration in wave groups, and programs for calculating wave loads on several kinds of structures. Solves the conceptual separation of deterministic and stochastic approaches to wave theory seen in other resources through the application of quasi-determinism (QD) theory Combines the distinct experimental activities of field measurements and wave tank experiment using small-scale field experiments (SSFEs) Simplifies and applies the ground-breaking work and techniques of this leading expert in wave theory and marine construction

Wind energy. Methods for computation of wave forcing and the resulting motion of a slender offshore floating structure Dec 07 2020 Academic Paper from the year 2014 in the subject Engineering - Civil Engineering, grade: 1,0, University of Hannover (A&M University Texas, Ludwig-Franzius-Institut für Wasserbau, Ästuar- und Küsteningenieurwesen), language: English, abstract: This thesis investigates how wave loads act on an OC3 Hywind spar-buoy. The author analyzes the resulting motions of the support platform. This work also contains a detailed presentation of the topic with useful additional information and graphics. Unlike fossil fuels (like oil, coal and natural gas), wind energy is a renewable energy resource. Since winds at sea are stronger and more consistent than onshore winds, the demand for offshore wind turbines has increased over the last years. As energy can be produced more efficient in deeper water, several floating offshore wind turbine constructions, such as the OC3 Hywind spar-buoy, have been proposed. The design of floating wind turbines depends on the simulation of the system behavior caused by exciting forces. A general overview of regular and irregular waves as well as hydrostatic and hydrodynamic loads acting on floating structures is given in chapter 2. Furthermore, essential formulations for calculating motions of FOWTs are given at the end of this chapter. Since all simulations carried out in this thesis are based on the OC3 Hywind concept, detailed information about this floating wind turbine model are given in chapter 3. Three different methods are used for the estimation of wave induced loads and motions. Section 4 describes a modified Morison formulation in the time domain which is applied by the commercially available software MATLAB. On the basis of the diffraction theory the commercial offshore software package SESAM simulates wave excitation forces and responding motions which are presented and discussed in chapter 5. The third method is the open source code FAST that computes wave induced loads and motions based on the first-order potential theory and Kane's equation of motion. Basic formulations used in FAST and essential hydrodynamic results are shown in chapter 6. The comparisons between the simulations of the three programs are represented and the individual results are analyzed in chapter 7.

Wave Forces on a Dock Feb 09 2021 The present investigation is concerned with the prediction of wave forces that act vertically on a horizontal deck under the action of periodic waves. Tests were made for a variety of clearances between the deck and the still water level, and for a variety of wave heights and periods. Although the structural behavior of the pier deck may affect the magnitude of the forces, in this investigation, it was assumed that the deck is infinitely rigid. (Author).

Probabilistic Design Tools for Vertical Breakwaters Jul 14 2021 This work describes the key results of the European research project called PROVERBS to develop and implement probability-based methods for the design of monolithic coastal structures and breakwaters subject to sea wave attacks. The issues treated include the hydrodynamic, geotechnical and structural processes involved in the wave-structure-foundation interactions and in the associated failure mechanisms.

Wave Loading on Vertical Sheet-pile Groins and Jetties Oct 05 2020

Comparison of methods for the computation of wave forcing Apr 11 2021 Presentation slides from the year 2014 in the subject Engineering - Civil Engineering, grade: 1,0, University of Hannover, language: English, abstract: Unlike fossil fuels (e.g. oil, coal and natural gas), wind energy is a renewable energy resource. Since winds at sea are stronger and more consistent than onshore winds, the demand for offshore wind turbines has increased over the last years. As energy can be produced more efficient in deeper water, several floating offshore wind turbine constructions, such as the OC3 Hywind spar-buoy, have been proposed. The design of floating wind turbines depends on the simulation of the system behavior caused by exciting forces. This thesis deals with the comparison between different methods for calculating wave forces and resulting platform motions of a floating offshore wind turbine. On the one hand, wave exciting loads computed with Morison's equation are compared to the hydrodynamic forces simulated by the open source code FAST on the basis of the diffraction theory. On the other hand, response motions of the floating structure are simulated by the commercial offshore software SESAM in the frequency domain and compared with the motions calculated by FAST in the time domain.

Piers, Jetties and Related Structures Exposed to Waves Jul 26 2022 "This book not only brings together existing guidance on hydraulic design, including design wave conditions, prediction of scour and vessel mooring loads, but also presents new methods (developed from extensive laboratory testing) for the prediction of wave loading, including forces on the underside of jetty decks. These guidelines will help maritime designers to optimise jetty designs, and are an essential reference resource."--BOOK JACKET.

Wave Forces on Breakwaters Mar 30 2020

Ocean Wave Kinematics, Dynamics, and Loads on Structures May 24 2022 Sixty peer-reviewed papers presented at the April-May 1998 symposium focus on the exchange of knowledge between academics and practitioners on subjects of crucial to the successful design of offshore and coastal structures and to the study of pollutant transport in ocean waters. The papers present recent advances in the understanding, measurement, and prediction of wave kinematics, wave dynamics, and wave loads acting on offshore and coastal structures, and include new theories, models, statistics, and measurements. Annotation copyrighted by Book News, Inc., Portland, OR

Wave Forces on Models of Submerged Offshore Structures Apr 23 2022 The results of a model study of the forces caused by oscillatory waves on large rectangular tank-like submerged objects are presented. Three phases of the problem were examined: 1) description of the forces in terms of dimensionless parameters, 2) description of the effect of large wave heights which are of importance to the designer, and 3) the presentation of a format to be used in model studies on submerged structures. Theoretical studies of the problem have assumed wave heights to be small and the forces to be entirely inertial. However, of interest to the engineer are the forces caused by the larger waves generated by severe storms. In the model study the forces caused by the larger waves were determined and the effect of the water particle velocity in producing a drag force was examined. The relationships between the fluid particle displacement and the coefficients of mass and drag were evaluated. Previous studies indicate that particle displacement is related to the values of empirical coefficients assumed by previous investigation. The experimental results are given in a dimensionless form. Provided the laws of modeling are followed, and there are no scale effects, these results may be used to determine the forces on prototype structures in the ocean.

A comparison of methods for computation of wave forcing Mar 10 2021 Diploma Thesis from the year 2014 in the subject Engineering - Civil Engineering, grade: 1,0, University of Hannover (A&M University Texas, Ludwig-Franzius-Institut für Wasserbau, Ästuar- und Küsteningenieurwesen), language: English, abstract: Unlike fossil fuels (for example oil, coal and natural gas), wind energy is a renewable energy resource. Since winds at sea are stronger and more consistent than onshore winds, the demand for offshore wind turbines has increased over the last years. As energy can be produced more efficient in deeper water, several floating offshore wind turbine constructions, such as the OC3 Hywind spar-buoy, have been proposed. The design of floating wind turbines depends on the simulation of the system behavior caused by exciting forces. This thesis deals with the comparison between different methods for calculating wave forces and resulting platform motions of a floating offshore wind turbine. On the one hand, wave exciting loads computed with Morison's equation are compared to the hydrodynamic forces simulated by the open source code FAST on the basis of the diffraction theory. On the other hand, response motions of the floating structure are simulated by the commercial offshore software SESAM in the frequency domain and compared with the motions calculated by FAST in the time domain.

Waves and Wave Forces on Coastal and Ocean Structures Aug 15 2021 This book focuses on: (1) the physics of the fundamental dynamics of fluids and of semi-immersed Lagrangian solid bodies that are responding to wave-induced loads; (2) the scaling of dimensional equations and boundary value problems in order to determine a small dimensionless parameter ? that may be applied to linearize the equations and the boundary value problems so as to obtain a linear system; (3) the replacement of differential and integral calculus with algebraic equations that require only algebraic substitutions instead of differentiations and integrations; and (4) the importance of comparing numerical and analytical computations with data from laboratories and/or nature. Contents:Mathematical PreliminariesFundamentals of Fluid MechanicsLong-Crested, Linear Wave Theory (LWT)Wavemaker TheoriesNonlinear Wave TheoriesDeterministic Dynamics of Small Solid BodiesDeterministic Dynamics of Large Solid BodiesReal Ocean Waves Readership: Graduate students and practitioners in ocean and coastal engineering. Keywords:Deterministic and Nondeterministic Wave-Structure Interactions;Linear and Nonlinear Wavemaker Theories;Linear and Nonlinear Wave Theories;Fundamental Fluid Mechanics;Chaotic Analysis of Cross-Waves

Ocean Wave Forces on Piles Aug 03 2020

Ocean Waves Engineering Feb 27 2020 This title presents recent advances in the theoretical and numerical aspects of problems arising in ocean waves engineering and links theoretical developments with practical applications. With contributions from experts, topics include: hydrodynamic forces on fixed and floating structures, wave loads and response of tension-leg platforms, linearized theory of water waves, Painleve analysis, non-linear evolution equations, numerical modelling of nonlinear propagation of water waves and variational inequalities in physical oceanography.

Wave Mechanics and Wave Loads on Marine Structures Sep 28 2022 The analysis, design and construction of offshore structures is arguably one of the most demanding sets of tasks faced by the engineering profession. Over and above the usual conditions and situations met by land-based structures, offshore structures have the added complication of being placed in an ocean environment where hydrodynamic interaction effects and dynamic response become major considerations in their design. A basic understanding of a number of key subject areas is essential to an engineer likely to be involved in the design of offshore structures. Wave Mechanics and Wave Loads on Marine Structures provides a broad overview of some of the key factors in the analysis and design of offshore structures to be considered by an engineer uninitiated in the field of offshore engineering. Topics covered range from water wave theories, structure-fluid interaction in waves to the prediction of extreme values of response from spectral modeling approaches. It presents a new outlook on the measurement of wave forces on ocean structures, uniting the deterministic and probabilistic methodologies to wave theory and linking the methods used in field and experimental measurement.

Wave Forces on Piles Oct 25 2019

Large-scale Tests of Wave Forces on Piling Sep 23 2019 Contains 3 letters to Prof. Robert L. Wiegel dated November 6, 1969, February 8, 1971, and September 16, 1971 from R. P. Savage and John C. Farichild regarding test numbers.

Mechanics of Wave Forces on Offshore Structures Dec 19 2021

The Statistical Distribution of Ocean Wave Forces on Vertical Piling Jan 08 2021

Offshore Compliant Platforms Jul 22 2019 A guide to the analysis and design of compliant offshore structures that highlights a new generation of platforms Offshore Compliant Platforms provides an authoritative guideto the analysis and design of compliant offshore structures and puts the focus on a new generation of platforms such as: triceratops, Buoyant Leg Storage and Regasification platforms. Whilst the authors – noted experts on the topic – include basic information on the conceptual development of conventional platforms, the book presents detailed descriptions of the design and development of new deep-water platforms. The book describes the preliminary design of triceratops in ultra-deep waters and presents a detailed analysis of environmental loads that are inherent in offshore locations such as wave, wind and current. The new methodology for the dynamic analysis of triceratops under ice loads,

predominantly in ice-covered regions, is also examined with detailed parametric studies. In addition, the book covers the structural geometry and the various methods of analysis for assessing the performance of any other similar offshore platform under the special loads. A discussion of the fatigue analysis and service life prediction is also included. This important book: • Includes the analysis and design of compliant offshore structures with a focus on a new generation of platforms • Examines the preliminary design of triceratops in ultra-deep waters • Covers an analysis of environmental loads that are inherent in offshore locations such as wave, wind and current • Reviews the structural geometry and various methods of analysis for assessing the performance of any other similar offshore platform under special loads • Discusses fatigue analysis and service life prediction Written for engineers and researchers across engineering including civil, mechanical, structural, offshore, ocean and naval architecture, Offshore Compliant Platforms fills the need for a guide to new offshore platforms that provides an understanding of the behaviour of these structures under different loading conditions.

An Experimental Study of Some of the Fundamental Aspects of Wave Induced Forces on Cylindrical Objects Sep 04 2020

Wave Mechanics and Wave Loads on Marine Structures Oct 17 2021 Wave Mechanics and Wave Loads on Marine Structures provides a new perspective on the calculation of wave forces on ocean structures, unifying the deterministic and probabilistic approaches to wave theory and combining the methods used in field and experimental measurement. Presenting his quasi-determinism (QD) theory and approach of using small-scale field experiments (SSFEs), author Paolo Boccotti simplifies the findings and techniques honed in his ground-breaking work to provide engineers and researchers with practical new methods of analysis. Including numerous worked examples and case studies, Wave Mechanics and Wave Loads on Marine Structures also discusses and provides useful FORTRAN programs, including a subroutine for calculating particle velocity and acceleration in wave groups, and programs for calculating wave loads on several kinds of structures. Solves the conceptual separation of deterministic and stochastic approaches to wave theory seen in other resources through the application of quasi-determinism (QD) theory Combines the distinct experimental activities of field measurements and wave tank experiment using small-scale field experiments (SSFEs) Simplifies and applies the ground-breaking work and techniques of this leading expert in wave theory and marine construction

Water Wave Kinematics Jul 02 2020 Proceedings of the NATO Advanced Research Workshop, Molde, Norway, May 22-25, 1989

Analysis of Wave Forces on a 30-inch Diameter Pile Under Confused Sea Conditions Jun 13 2021

Hydrodynamics of Offshore Structures Jun 25 2022 The subject of hydrodynamics applied to offshore structures is vast. The topics covered in this book aim to help the reader understand basic principles while at the same time giving the designer enough information for particular designs. Thus, results are given with derivations, and applications are discussed with the aid of examples, with an overview of the advantages and limitations of the method involved. This makes the book suitable as a text for undergraduate and graduate students specializing in offshore and ocean engineering.

Wave Forces on Piling Dec 27 2019

Wave Forces on Rubble-mound Breakwaters and Jetties Aug 23 2019

Tables of the Statistical Distribution of Ocean Wave Forces and Methods of Estimating Drag and Mass Coefficients Jan 28 2020

Wave Forces on Offshore Structures May 12 2021 A thorough understanding of the interaction of waves and currents with offshore structures has now become a vital factor in the safe and economical design of various offshore technologies. There has been a significant increase in the research efforts to meet this need. Although considerable progress has been made in the offshore industry and in the understanding of the interaction of waves, currents, and wind with ocean structures, most of the available books concentrate only on practical applications without a grounding in the physics. This text integrates an understanding of the physics of ocean-structure interactions with numerous applications. This more complete understanding will allow the engineer and designer to solve problems heretofore not encountered, and to design new and innovative structures. The intent of this book is to serve the needs of future generations of engineers designing more sophisticated structures at ever increasing depths.

Analysis of Wave Forces on a 30-inch Diameter Pile Under Confused Sea Conditions Jun 01 2020

Surface Waves and Offshore Structures Jun 20 2019

Waves and Wave Forces on Coastal and Ocean Structures Oct 29 2022 This book focuses on: (1) the physics of the fundamental dynamics of fluids and of semi-immersed Lagrangian solid bodies that are responding to wave-induced loads; (2) the scaling of dimensional equations and boundary value problems in order to determine a small dimensionless parameter ? that may be applied to linearize the equations and the boundary value problems so as to obtain a linear system; (3) the replacement of differential and integral calculus with algebraic equations that require only algebraic substitutions instead of differentiations and integrations; and (4) the importance of comparing numerical and analytical computations with data from laboratories and/or nature.

Breaking wave load of a vertical slender cylinder within a cylinder group Jan 20 2022 Research paper from the year 2006 in the subject Engineering - Civil Engineering, grade: 1,3, Technical University of Braunschweig (Leichtweiss-Institute for Hydraulic Engineering and Water Resources, Department of Coastal Engineering), 24 entries in the bibliography, language: English, abstract: Slender cylinders are widely used as a structural element in offshore structures. Oil platforms, jetties and piers are often supported by group of cylinders, which are arranged closely spaced. The Morison equation (Morison et al., 1950) constitutes a simple tool to calculate the wave force on one single cylinder. To what extent the cylinders, which are arranged in a group, affect each other is extensively unclear. As these group interference effects are not considered in the Morison equation there is a lack of a generally accepted formula to calculate the individual forces on cylinders within cylinder groups. In this student research project the special loading case of breaking waves acting on cylinder groups is examined. Breaking waves developed from wave superposition during a storm may cause great impact loads also in deep water. The investigation of breaking waves leads to the upper bound of possible loads on offshore structures. A closer analysis of the so called impact force and the validation of former assumptions of considering it is not part of this paper. The main focus lies on the interactions between cylinders arranged in groups when a single breaking wave impinges the group or a part of it. These interactions are investigated based on large-scale experiments, which have been performed in summer 2004 in the Large Wave Flume (GWK) at the Coastal Research Centre (FZK) in Hanover. Fifteen configurations of cylinder groups have been examined, including one configuration with one single cylinder and fourteen configurations of groups up to three cylinders arranged in row or transversely. The single cylinder and one cylinder in each cylinder group are equipped with strain gauges on the top, which measure the bending moments during the tests. These measuring cylinders, in the single arrangement and in the group arrangements, have the same position in the wave flume. Therefore the comparison of the measured bending moments of the single cylinder with those of the cylinder in the group provides information about the influence of the adjacent elements in a cylinder group. The results of the single cylinder test can be taken as a reference for the results of the cylinder group’s tests.

Wave Forces on Offshore Structures Feb 21 2022 This book provides a thorough understanding of the interaction of waves and currents with offshore structures.

Wave Forces on Circular Piles Nov 06 2020

On the Prediction of the Extreme Value of Wave Loads Sep 16 2021

The Statistical Distribution of Ocean Wave Forces on Vertical Piling Nov 25 2019