

Hydro-Seminar

by Lab. of Floating-Body Dynamics in Waves

The speaker in the 44th Hydro-Seminar is

Professor Bettar O. el Moctar

Ship Technology and Ocean Engineering
at the University of Duisburg-Essen, Germany



Date: Tuesday, 10 October, 2017

Time: 15:30 – 17:00

Venue: S1-412 (Lecture room, 4F of S1 building)
Suita Campus, Osaka University

CFD and FE Methods based Prediction of Seakeeping and Sea Loads Acting on Ship and Offshore Structures

Abstract

The reliable prediction of loads is crucial for the safety assessment of ships and offshore structures. Different institutions promote the paradigm shift in structural design rules for ships towards risk based approaches. One of the key issues is the structural ultimate strength of, i.e., primary or local structural components. Corresponding loads are typically experienced in severe sea states, where full-scale measurement data are scarce. Rational assessment of design loads for ultimate strength thus requires appropriate numerical tools to deal with such severe environmental conditions.

Field methods based on the Reynolds-averages Navier Stokes equations provide appropriate means to capture nonlinear flow features relevant for time domain simulation of ships and offshore structures in severe environments. Wave-wave interactions and wave breaking, for example, are implicitly accounted for. It is impractical to apply a straight-forward nonlinear time domain simulation for a long-term assessment. Instead, based on the design sea state and wave train approaches, I present here numerical procedures that combine the use of a boundary element method (BEM), an extended Reynolds-averaged Navier-Stokes equation solver, and a finite element method (FEM). Computed free surface elevations, motions, impact and sectional loads, including fluid-structure-interaction effects in regular and irregular waves, are compared with experimental data obtained from extensive model tests. The presentation reports on progress achieved as well as current improvements.

The Speaker: Professor Bettar O. el Moctar

Professor Moctar was born in Mauritania and studied Naval Architecture & Ocean Engineering at the Technical University Hamburg-Harburg (TUHH), Germany during 1997-2000, and he got the PhD in 2001 majoring in Ship Hydrodynamics. He joined Hamburg Model Basin (HSVA) as Research Engineer in 2000 and moved to Germanischer Lloyd AG, Germany in 2002 as Research Engineer and Deputy Head of Hydrodynamics, and became Head of Fluid Dynamics in 2006. In 2008 he was employed as Full Professor in Ship Technology and Ocean Engineering at the University of Duisburg-Essen, Germany and now he is also Director of the model basin.

Basically Professor Moctar has been working on seakeeping problems, such as nonlinear ship responses in waves, impact loads, hydroelastic effects of ships in extreme seas, added resistance by means of CFD and Rankine source methods. At present, he is Editor-in-Chief of Journal of Ship Technology Research and also co-editors of several journals. He is the members of ITTC and ISSC, representing Germany.



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