

Hydro-Seminar

by Lab. of Floating-Body Dynamics in Waves

The speaker in the 41st Hydro-Seminar is

Professor Yonghwan Kim

Department of Naval Architecture & Ocean Engineering
Seoul National University, Seoul, Korea

Date: Monday, 10 July, 2017

Time: 15:30 – 17:00

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



Sloshing Problem in Marine Engineering

Abstract

Sloshing problem is one of classical problems in fluid dynamics. In marine engineering, the analysis of sloshing is one of crucial elements for the design of liquefied-natural-gas (LNG) cargo. Since LNG must be kept under -163 degree Celsius, special insulation system is required. The insulation systems of LNG cargo, particularly in the case of membrane-type LNG carriers or FLNG, do not have enough strength like steel, there sloshing-induced impact can cause severe damage on the cargo wall. As the size of LNG carriers and FLNG is getting larger, sloshing problem became more critical to ensure the strength of cargo containment system.

In this lecture, the engineering problems related to the sloshing in marine engineering will be introduced. The engineering demand and technical issues in partially-filled LNG cargo will be described. Then the technical approaches for the prediction of sloshing impact pressure will be introduced. This lecture will focus on two main approaches: model-scale experiment and CFD analysis. Seoul National University has the largest sloshing experimental facility in the world, and academic and industrial researches on sloshing analyses will be introduced. Also CFD simulation based on SNU's in-house code and commercial software will be shown and compared with experimental measurement. PIV measurement on sloshing flows will be shown to explain the physics involved in hydrodynamic impact occurrence.

The Speaker: Professor Yonghwan Kim

Professor Kim graduated Seoul National University for his bachelor and master degrees in 1987 and 1989, and got a PhD degree at MIT in 1998. He worked at Daewoo Shipbuilding and Marine Engineering Co., ABS and MIT, and he joined Seoul National University in 2004. Currently he is a chair of the Department of Naval Architecture and Ocean Engineering at Seoul National University, and the director of Advanced Marine Engineering Center and the Lloyd's Register Foundation Center. Also he is designated as a specially-appointed professor of Osaka University through the promotion program for international collaboration with Professor Masashi Kashiwagi.

His primary research areas marine hydrodynamics, including motion responses of ships and offshore structures, sloshing, ship hydroelasticity, green ship technology, and naval hydrodynamics. He is the author of more than 350 technical papers, and he is serving for several international journals as editor-in-chief, associate editor, and editorial board member.

He is a member of Korean Academy of Engineering and Fellow of RINA. Also he was chosen as the Distinguished Visiting Fellow of Royal Academy of Engineering, UK, in 2015~2016.



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