

# Hydro-Seminar

by Lab. of Floating-Body Dynamics in Waves

The speaker in the 48th Hydro-Seminar is

## Professor Pierre Ferrant

Laboratoire de Recherche en Hydrodynamique, Energetique  
et Environnement Atmospherique (LHEEA Lab.),  
Ecole Centrale de Nantes, Nantes, France  
Specially Appointed Professor of Osaka University



**Date:** Tuesday, 20 November, 2018  
**Time:** 16:15 – 17:15  
**Venue:** S1-312 (Lecture room, 3F of S1 building)  
Suita Campus, Osaka University

## Progress in coupling potential flow and CFD models for wave-structure interaction problems

### Abstract

Despite their continuous development, Computational Fluid Dynamic (CFD) solvers remain relatively inefficient for modelling water wave generation and propagation. The concept of combining (or coupling) potential flow models and CFD models for solving wave-structure interaction problems is therefore more and more recognized as an efficient strategy for optimizing computer resources and accuracy in such simulations. Such an approach has been developed and promoted over the last 15 years by the LHEEA Lab. research department in Centrale Nantes, France.

In this presentation, two distinct recent developments will be presented and discussed, both based on the open source two-phase CFD solver OpenFoam:

- Extension of the SWENSE methodology to a 2-phase CFD solver (functional decomposition approach)
- Generation of regular and irregular waves in CFD solvers via domain decomposition and relaxation zones

### The Speaker: Professor Pierre Ferrant

Prof. Pierre Ferrant graduated in 1981 from Ecole Centrale de Nantes, with a specialization in mechanical engineering and shipbuilding. He obtained a Master degree (DEA) in 1982 and defended his doctoral thesis in 1988 on the numerical simulation of nonlinear wave-body interactions.

After several positions of research assistant in Ecole Centrale de Nantes, P. Ferrant joined SIREHNA, a start-up from Ecole Centrale de Nantes, in which he was responsible for the development of nonlinear simulation methods for ocean waves and wave-structure interactions. He joined Ecole Centrale de Nantes as an assistant professor in 1998, and he was promoted to full professor in 2008, and first class professor in 2013. Since 1998, he has held different positions in ECN: Scientific responsibility for the development of experimental activities in hydrodynamics since 1998, deputy head of the research team 'Hydrodynamics and Ocean Engineering of the Fluid Mechanics Lab of Ecole Centrale de Nantes (LMF – UMR6598) (2004-2012). In the period 2010-2012, he managed the restructuration of the LMF, with the creation of the new laboratory, LHEEA, standing for 'Laboratoire de recherche en Hydrodynamique, Energetique et Environnement Atmospherique'. P. Ferrant is director the LHEEA since 2012. Prof. Pierre Ferrant has supervised 25 PhD theses and has published more than 200 papers in international journals, book chapters, or refereed conference proceedings.



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