首届船舶与海洋工程计算水动力学专题研讨会 (CMHL Symposium-2018)

时　间：**2018 年 12 月 28 日（星期五），下午 14:00**

地　点：上海交大闵行校区木兰船建大楼 **B601** 会议室

主持人：万德成 教授

14:00-14:05 开幕式

14:05-14:50 主题报告1

胡长洪 教授：**CFD Modelling of Multi-Physics Engineering Problems**

14:50-15:35 主题报告2

王建华 博士：**CFD Study of Ship Maneuvering in Waves and High-Speed Ships with Breaking Bow Waves**

15:35-16:00 茶歇

16:00-16:45 主题报告3

刘成 长聘副教授：**直角网格自适应方法在可压缩流动中的应用**

16:45-17:30 主题报告4

赵伟文 博士：**CFD Simulations of Vortex-Induced Motions for Multi-Column Semi-Submersibles**

17:30-18:30 讨论交流和闭幕式

欢迎大家参加！

联系人：万德成 教授　　　　　　**Email: dcwan@sjtu.edu.cn**

胡长洪教授：

Changhong Hu(胡长洪) is a professor of ocean engineering and the head of renewable energy dynamics division at Research Institute for Applied Mechanics (RIAM), Kyushu University, Japan. He received his B.S. in 1987, M.S. in 1990 and PhD in Marine Hydrodynamics in 1995 from Shanghai Jiao Tong University (SJTU). From 1995 he served as assistant, associate, and full professor at Kyushu University. In the academic year 2004 he worked in Norwegian University of Science and Technology (NTNU) as a visiting associate professor. From 2016 he became a guest professor of SJTU. His current research interests include next generation computational fluid dynamics methods for marine hydrodynamics, ocean renewable energy technologies, and hydrodynamics problems in ship and ocean engineering. Recently he has been involved in several national research projects of Japan on offshore wind and tidal current energy developments.

主题报告 1：CFD Modelling of Multi-physics Engineering Problems
Many of the engineering problems have multi-physics and multi-scale nature, which will be one of the major research challenges in future CFD development. In our research group researches on multi-physics CFD modeling are being carried out. In this presentation, some recently obtained results on the researches will be introduced.

王建华博士：

王建华，博士，助理研究员。主要从事船舶计算水动力学、船桨舵耦合、波浪中船舶操纵等方面的研究，并作为主要的开发人员参与完成了课题组多个计算水动力学软件的开发工作。主持国家自然科学基金青年项目 1 项，参与工信部数值水池创新专项、豪华邮轮专项等多个船海工程水动力性能相关的重大课题。多次参加船舶与海洋工程计算水动力学领域顶级的国际会议，并作交流报告，发表学术论文 30 余篇，申请软件著作权 2 项。

主题报告 2：CFD Study of Ship Maneuvering in Waves and
High-Speed Ships with Breaking Bow Waves

船舶在波浪中的操纵以及高航速船艏兴波破碎是目前船舶水动力问题中较为复杂的两个问题。本报告从 CFD 程序开发和应用方面分别介绍了万德成教授研究团队在波浪中船舶操纵以及高航速船艏兴波破碎两个问题上的研究。数值模拟工具采用研究团队基于开源平台 OpenFOAM 自主开发的船舶水动力学求解器 naoe-FOAM-SJTU，针对波浪中船舶操纵运动问题专门开发了自航操纵控制以及波浪中船舶操纵求解模块，实现了船桨舵相互作用情况下的波浪中操纵运动的直接模拟。并且应用到了双桨双舵的 ONRT 标准船模在波浪中的航向保持、Z 形操纵以及回转操纵等的直接模拟，数值预报结果同试验结果进行了对比验证。此外，针对高航速船艏兴波破碎问题，分别开展了基于 RANS 方法以及 DES 方法的数值模拟研究，并且同拖航试验进行了波形对比分析，验证了数值方法对高航速船艏兴波破碎问题的适用性。

刘成副教授：

刘成目前是上海交大船舶建筑与海洋工程学院长聘教轨副教授。2014年于九州大学综合理工学府获博士学位。研究方向为计算流体力学及其在船舶海洋工程中的应用。近些年在自适应网格，高精度格式，界面流动方面做了相关研究。成果发表在数值计算领域专业期刊 Journal of Computational Physics, International Journal for Numerical Method in Fluid, Computer Physics Communications 等。

主题报告 3： 直角网格自适应方法在可压缩流动中的应用

报告人基于直角自适应网格编程框架系统，构建了多种高精度数值方法，能够显著减少数值耗散并降低计算开销。所开发的求解器可用于单相或多相可压缩流动的直接数值模拟(DNS)。报告人采用改进的虚拟流体(Ghost Fluid)方法用于多组分可压缩流动的数值计算，对研究船舶海洋工程中涉及可压缩流动的物理问题具有潜在应用价值。

赵伟文博士：

Dr. Weiwen Zhao is currently a member of Computational Marine Hydrodynamics Laboratory (CMHL) at Shanghai Jiao Tong University (SJTU). His researches mainly focus on the developments of CFD techniques, such as hybrid RANS/LES methods, Detached-Eddy Simulation, dynamic overset grid methods, and their application to the vortex-induced motions of floating offshore platforms.

主题报告 4： CFD Simulations of Vortex-Induced Motions for multi-column semi-submersibles

Vortex shedding of multi-column floating structure is more complex than single column floater because of the wake interference between columns. The vortex sheds from upstream columns will impinge upon the downstream columns and change the surface pressure, which sequentially affects the dynamic response of vortex-induced motions (VIM). This study tries to reveal the mechanisms of the vortex shedding, wake interference, and their impacts on the VIM of a paired-column semi-submersible by means of computational fluid dynamics (CFD). In the present work, a scaled model (1:54) of paired-column semi-submersible (PC-Semi) is studied. The CFD solver used in this study is an in-house CFD code naoe-FOAM-SJTU, which is developed on top of the OpenFOAM framework. Turbulent flows around the geometry are modeled by delayed detached-eddy simulation (DDES). Meanwhile, the motions of the model are obtained by solving six-degrees-of-freedom motions equations and are constrained in the horizontal plane. Numerical simulations at different current headings and reduced velocities are performed. The overall motion responses of the structures are evaluated. Vortex shedding process and wake impingement on downstream columns are also discussed. These results show how the vortex shedding process and wake impingement influence the VIM characteristics of a multi-column floating structures.