上海交通大学 SHANGHAI JIAO TONG UNIVERSITY

船舶海洋与建筑工程学院 School of Naval Architecture, Ocean & Civil Engineering

法国南特中央理工大学李曌斌博士学术报告

报告题目： Spectral Wave Explicit Navier-Stokes Equations for wave-structure interaction

时　　间： **2019 年 9 月 16 日（星期一），下午 14:30**

地　　点： 上海交大闵行校区木兰船建大楼 **B801** 会议室

报 告 人： Dr. Zhaobin LI, LHEEA research department, Ecole Centrale de Nantes, France

报告人介绍：

Dr. Zhaobin LI is a post-doc at LHEEA research department, Ecole Centrale de Nantes, France. He received his B.S. and M. Eng. from Shanghai Jiao Tong University. From 2015, he started his PhD project in ECN under the supervision of Prof. Pierre Ferrant. His research interest covers several areas, including wave-structure interactions, potential/viscous flow coupling.

报告内容简介：

Nowadays, Computational Fluid Dynamics (CFD) based Numerical Wave Tanks (NWT) are increasingly used for marine and offshore applications. CFD solvers offer possibilities to investigate complex flow phenomena, such as flow separation and wave breaking, which are not feasible with traditional potential theory (PT) based NWTs. However, the CFD solvers often requires more computational resources. As both CFD and PT have clear advantages and drawbacks, research in coupling CFD and PT emerges to combine the advantages from each side. The Spectral Wave Explicit Navier-Stokes Equations (SWENSE) is a PT-CFD coupling method. It uses the PT to solve the incident wave propagation in the entire fluid domain with fully nonlinear spectral wave models and uses the CFD solver to obtain a corrector on the incident wave (the complementary part), mostly due to the presence of the structure. As the interesting zone of the complementary part is often only near the structure, coarse mesh can be used in the far-field of the CFD domain, achieving a reduction of CPU time for similar accuracy. The most recent work is an extension of the SWENSE method for two-phase CFD solvers. Implemented within OpenFOAM, the two-phase SWENSE method is tested by several convincing validation cases of engineering significance, including calculating the wave load on fixed-offshore structure, ship resistance in waves, the response of a wave-energy convertor in irregular waves. A remarkable gain in CPU time is achieved by the SWENSE method compared with standard NS based solvers.

欢迎大家参加！

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