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HIGH-PERFORMANCE TOOLS FOR FREE-SURFACE FLOWS AND FLOATING BODIES

(1500 FLUID-STRUCTURE INTERACTION, CONTACT AND INTERFACES)

JEFFREY C. HARRIS*, CHRISTIAN F. JANSSEN†

*LHSV, Ecole des Ponts, CEREMA, EDF R&D
Chatou, FRANCE
jeffrey.harris@enpc.fr
https://www.saint-venant-lab.fr/membres/harris_jeffrey

†Altair Engineering, Detroit, MI, USA
christian.janssen@altair.com
http://www.altair.com

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ABSTRACT

Many engineering problems depend on modeling the interaction of water waves and offshore structures, such as for floating wind turbines, seakeeping analysis of ships, or understanding coastal hazards like tsunamis. A wide variety of solvers can be useful, including (but not limited to) solvers based on potential flow theory, Euler equations, or Navier-Stokes equations. In most cases, the computational time needed to consider real-world engineering problems is significant, even with high-performance tools, requiring advanced numerical algorithms, parallel computing, or both. The simulation of floating bodies is particularly complex, with the possibility of wave breaking and often the need to couple multiple models to handle viscous or inviscid aspects, or to handle mooring lines or other physical attachments while not adversely affecting the computational speed of the final simulation.

This mini-symposium aims to bring together researchers specializing in mathematical or numerical details with those who focus on engineering applications, in order to exchange new ideas and results related to wave-structure interaction. Of particular interest are applications of offshore floating structures, but all papers involving free-surface flows are welcome, including different types of models (such as simplified approaches to improve computational time), or those involving fixed structures.