

## NUMERICAL MODELS FOR OFFSHORE ENGINEERING

JESÚS M. BLANCO<sup>\*</sup>, UNAI FERNÁNDEZ<sup>\*</sup>, GUILLAUME DUCROZET<sup>†</sup>, LIONEL GENTAZ<sup>†</sup>

<sup>\*</sup> University of the Basque Country UPV/EHU,  
School of Engineering, Dept. of Fluid Mechanics  
Alda. Urquijo s/n, 48013 Bilbao, SPAIN

[jesusmaria.blanco; unai.fernandez]@ehu.es; <http://www.ehu.eus/es/bilboko-ingeniaritza-eskola>

<sup>†</sup> Ecole Centrale de Nantes  
LHEEA Lab., UMR CNRS 6598  
1, rue de la Noë, 44321 Nantes, FRANCE

[guillaume.ducrozet; lionel.gentaz]@ec-nantes.fr; <http://www.ec-nantes.fr/>

**Key words:** Computational Fluid Dynamics, Numerical Models, Offshore Engineering

### ABSTRACT

Numerical approaches such as finite element, boundary element methods are widely used by engineers and scientists. With the use of high-performance computers, those tools have greatly widened the scope of engineering problems amenable to numerical analysis. In looking at trends, the need for numerical simulation is increasing because it is one of the most powerful tools in developing a deeper understanding of the effects of variables on a system whereas the expensive experimental methods are considered for validation purposes.

The aim of this thematic session is to promote pedagogical, technical and practical advances in offshore engineering, improving and assessing new analytical and computational approaches. It will be focused on practical applications and innovative techniques used to improve engineering solutions. This includes, but is not limited to, experimental observations and methods, analytical or computational methods linked to observations of physical phenomena, and non-deterministic analysis of experimental observations. We would also encourage the submission of works that describe approaches in processes involving water waves simulation and the development of marine devices such as tidal and wind turbines among others, including wave-structure interactions, flow control devices, etc.

### REFERENCES

- [1] A.J. Hermans, *Water waves and ship hydrodynamics: an introduction*, Springer Science & Business Media, 2010.
- [2] O.M. Faltinsen, *Sea Loads on Ships and Offshore Structures*, Cambridge University Press, 1990.
- [3] F.M. White, *Fluid Mechanics*, 7th Ed., McGraw-Hill, 2010
- [4] J.F. Manwell, J.G. McGowan, A.L. Rogers, *Wind Energy Explained: Theory, Design and Application*, 2nd Edition, 2009.