

PHYSICAL AND NUMERICAL MODELING OF HYDRAULIC PERFORMANCES OF SUBMERGED BARRIERS

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Abstract

Submerged breakwaters are becoming popular alternative to coastal protection where a moderate degree of energy transmission is acceptable. Such situations induce a complicate wave field because of non-linear wave-structure interactions. In front and behind the structures local scour and changes of the bottom topography may take place due to the wave field. In the study of submerged barriers there are two aspects that have been the subject of research in recent years: the stability of the structure and hydraulic performances. As regards the stability on the barriers, the formulations contained on the Coastal Engineering Manual (CEM, 2002) have reached a good reliability. By contrast, the hydraulic performances such as transmission, reflection, hydrodynamics near the structure are still the subject of intensive studies.

Within the FP7 project ENVICOP (Environmentally Friendly Coastal Protection in a Changing Climate) the working group of the Second University of Naples (Italy), the Coastal Hydraulics Division, Bulgarian Ship Hydrodynamics Centre (Bulgaria), the Faculty of Engineering of the University of Porto (Portugal) and Scripps Institution of Oceanography (USA) is integrating as much as possible the previous researchers experiences combining the available specific research in the field of numerical and physical hydrodynamic modelling with the relevant experience gained through long-time research on coastal hydrodynamics and shoreline management.

The article critically analyze the results obtained in the different experiences of the working groups. As a conclusion, the article highlights key results and future developments of research on hydraulic performances of submerged barriers.

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