



Coastal scale operational oceanography with structural interactions

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Operational oceanography predictions are now starting to include coupled wind, wave and current fields for open ocean and shelf domains. However the same product for coastal scales, including a) the non-linearity of coastal processes, b) the effect of continental rain driven discharge and c) the interaction with coastal structures are still in an early stage of development, both for the physical and numerical aspects.

In this paper we shall explore a coupled wind-wave-current model based on the COWAST system but including also the continental discharge and the effect of coastal structures, in particular shore parallel detached breakwaters. We shall apply such a pre-operational code to a test case near Barcelona, where the concept of transient coastal defences is being considered. The available in-situ and remote observations should also allow a robust calibration.

The operational oceanography simulations will be used to support the activation of these transient coastal defences and therefore illustrate the challenges required by coastal scales under rapid storm development such as is commonly found in the Western Mediterranean. The benefits of applying a robust and high resolution coupled hydro-dynamic system will become apparent from the stand point of transient coastal defence deployment and risk mitigation in heavily populated coastal areas.