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VALIDATION OF THE SWAN MODEL FOR THE INFLUENCE OF OPPOSITE CURRENTS ON THE WAVE SPECTRA

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Abstract

In many coastal areas strong currents may occur from tidal effects, rivers discharges and high waves breaking due to abrupt changes in local topography. The modification of the wave fields by currents and vice versa need to be predicted by reliable nonlinear numerical models, when wave and current coexist along and around the approach tracks of the ports and harbors, or in the areas of ongoing offshore and coastal developments, or in areas subjected to intense navigation. Various wave models have been validated with full scale measurements made with wave rider buoys, but literature on simultaneous measurement of waves and currents at the same location are in general not available. Thus, it is not possible to fully validate the wave predictions in such situations. Therefore, the validation of numerical models in such conditions is usually made by studying the effect of the opposite currents on the wave spectra that have been produced in an offshore model tank. This is the topic of the present work that continues some previous experimental studies and is focused on the conditions that are usually met in the Black Sea at the mouths of the Danube River.

Key words: currents, experimental data, interactions, numerical model, SWAN, waves

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