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EVALUATION OF THE WIND INFLUENCE IN MODELING THE BLACK SEA WAVE CONDITIONS

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Abstract

The present work is focused on the importance of the resolution and accuracy of the wind fields in modeling waves in the Black Sea. Two different wind fields are considered for forcing the third generation spectral wave model SWAN. The wind data wave model results are compared against ‘in situ’ measurements performed at the Gloria drilling unit and also against satellite data for a two-month period of wintertime at the beginning of 2002. Subsequently, the model simulations were extended with other four months, time interval that corresponds to moderated wave conditions. Both direct comparisons and statistical results show that in such enclosed seas, as the Black Sea is, the wind resolution is a crucial factor in modeling waves. Moreover, the impact of increasing the wind resolution is even greater in the wave modeling than in the wind modeling. The underestimation of the extreme significant wave heights, a typical feature of the spectral models, is in general corrected when the high-resolution wind data is used but it still persists in high wind and wave conditions as well as in highly non stationary cases.

Key words: satellite data, SWAN, wind-data resolution, wind-generated waves, wave models

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