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A comparison between the results of hormuz strait wave simulations using WAVEWATCH-III and satellite altimetry observations

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In the present study, the capabilities of WAVEWATCH-III model for predicting wind-induced wave characteristics in the Hormoz Strait area are investigated. The input wind data were extracted from GFS (Global Forecast System) and introduced to the model with 5° spatial resolution and 6 hours' time steps. The bathymetry data, introduced to the model with 2 arc-minute spatial resolutions, also were derived from the ETOPO1. After the model was setup using aforementioned wind and bathymetry data, the effect of surface layer instability on wave growth was studied through considering the monthly averaged air-sea temperature difference. Results show that, during cold months when the surface layer is unstable, taking the air-sea temperature difference into account, the accuracy of model is enhanced in predicting significant wave height. A comparison between satellite altimetry observations and numerical simulation results suggest that, in January, the surface layer instability effects in the numerical simulation leads to higher correlation between significant wave height predicted by the numerical model and that obtained from satellite altimetry observations. It should be noted that the air-sea temperature difference, during the surface layer stability period, leads to no considerable changes in numerical simulation results. In the present study, the effect of air-sea temperature difference on numerical simulation of wind-wave in the Hormoz strait region was examined. All numerical simulations were carried out using the WAVEWATCH-III, using the GFS wind data and ETOPO1 bathymetry data. The model is forced by the Global Forecast System (GFS) data. Bathymetry data is also taken from the ETOPO1. Results of the numerical simulations suggest that in the periods of time when and consequently the surface layer is unstable, the effect of air sea temperature difference leads to a better agreement between the numerical simulation results and satellite altimetry observations.

Biography

Fatemeh Sadat Sharif is currently a physical oceanographer and had experience in wave and current fields and PhD student at Islamic Azad University, Iran. She modeled with WAVEWATCH III and Mike 21 and ROMS models.

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