
Comparison of wave spectra in the Agulhas current system using spectral wave models and SAR.

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Résumé

The purpose of this study was to characterize the effect of currents on wave spectra in the Agulhas current system. High resolution simulations were performed by applying two third generation spectral wave models (WAM and SWAN) with and without ocean currents. Ocean current data came from the operational Mercator global ocean analysis and forecast system, distributed by the Copernicus Marine Environmental Monitoring Service. The validation of the four numerical simulations was made for the Significant Wave Height (Hs) using all possible satellite altimetry data available for the study period and a coastal wave buoy.

Sentinel-1 (S1) wave mode Synthetic Aperture Radar (SAR) spectra are compared with WAM spectra. From the simulation considering ocean currents was observed that the quality of the modeled wave spectra increases. It was found that the directional wave spectra (from SAR and WAM) are similar, but the wave spectra are broadened when the ocean current is considered in the simulation. Relative errors between SAR swell spectra and WAM swell spectra are compared in the Agulhas retroreflection zone showing that when considering currents, errors are lower than in the case of the simulations without currents.

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