Global simulation with observation-based source terms in a third generation wave model

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Measurements collected in field experiment resulted in a set of input and dissipation terms for a third generation spectral wave model. The new wind input source term account for the dependence of growth increment on wave steepness, on airflow separation with relative reduction of the growth under extreme wind conditions, and for the decay of the wind input in case of adverse winds. The new white-capping dissipation source term consists of three terms, the inherent breaking term, the dissipation induced by longer waves, and swell dissipation. The source terms were tested in a global hindcast and validated against altimeter data from various altimeter missions. By tuning the coefficient for the swell attenuation and leaving all other parameters fixed the scatter in wave hight could be reduced when compared to the default physics in WAVEWATCH III. A significant portion of bias in the Southern Ocean and South Atlantic Ocean could be eliminated by including icebergs in the global hindcast.