

## Wave Breaking and Equilibrium Surfacewave Spectra

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Knowledge of the equilibrium range of surface wave spectra is of practical importance since existing numerical wave prediction models cannot solve right down to the smallest gravity waves. Recently, the authors proposed an analytical theory of the equilibrium spectra with an assumption that the wave induced stress is entirely due to nonbreaking waves. However, at high winds a significant portion of waves breaks and causes airflow separation and enhancement of the wave drag. In this paper the effect of enhanced wind input by breaking waves on the form of the equilibrium surface wave spectra is investigated. The theory is based on the conservation of momentum and energy in the wave boundary layer together with the conservation of the wave action spectrum. The results show that the breaking wave effect is not very strong for fully-developed wave spectra but may be significant for the spectra of growing seas.

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