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Statistics of Breaking Waves Observed as Whitecaps in the Open Sea

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ABSTRACT

Conventional observations of waves carried out with a buoy in open sea conditions were supplemented with simultaneous visual observations of whitecaps to identify breaking events in the buoy records. A statistical wave-by-wave analysis of these records indicates that such seemingly obvious parameters as wave steepness or wave asymmetry cannot be used to separate breakers from nonbreakers and the breaking occurs at wave steepness values much less than the theoretically expected steepness of a limiting wave. The observed fraction of breaking waves varied from about 0.10 to about 0.16, depending on wind speed. Two-thirds of the breaking waves were breaking in one-third of the wave groups for which a H_{rms} -threshold definition was used.

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