

Abstract

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Use of Wavelet Bicoherence in Analyzing Nonlinear Wind–Wave Interaction during Wave Growth

This study investigates the nonlinear wind–wave interaction that occurs during wave growth. Wavelet bicoherence is used in analyzing the detailed phase coupling and nonlinear interaction between wind speed and wave height considering both the sum and difference rules between different frequencies to give the full picture of nonlinear wind–wave interaction. The results show that the phase coupling and nonlinear wind–wave interaction in the case of considering the sum rule of the frequencies is different from the case of considering the difference rule of frequencies. This consequently emphasizes the importance of considering both rules in analyzing the phase coupling between wind speed and wave height during wave growth.