

Abstract

Application of Continuous Wavelet Analysis in Distinguishing Breaking and Nonbreaking Waves in the Wind–Wave Time Series

This study applied a new approach to distinguish between breaking waves and nonbreaking waves in the wind–wave time series through the use of wavelet analysis. In this paper, the wavelet power spectrum is computed to identify the variations in the energy content of the wind–wave time series with time; then it is integrated over frequency to provide the temporal variation of localized total energy. The study shows that the fluctuations of the time series of wind–wave are highly intermittent, i.e., the energy at different scales varies considerably with time. Furthermore, the local peaks of the energy densities correspond to the events of wave breaking in the wind–wave time series.