

Statistical Analysis of the Exponent in the Equilibrium

Range of Wind Wave Frequency Spectra

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Abstract

Wind wave spectrum in high frequency is very important because of its influence on air-sea interaction, and the reflectance properties of sea surface. An effort to estimate the exponent of the equilibrium range in wind wave high frequency and some other statistical properties, such as the distribution of the significant wave height, the relation between the peak frequency and wind energy and etc., are proceeded by using wave data recorded by a waverider deployed in Suruga Bay from Oct. 22, 1993 to March 18, 1994. The exponent of the equilibrium range is estimated by the least square fit method and is computed in four different frequency ranges. All the exponents in four different frequency ranges lie in the range from -3.5 and -5.0 and the mean of the exponent in equilibrium range is -4.08, which is consistent with Liu's (1989) results in Great Lake data and the theoretical result of Shen et al. (1993). However, the slope exponent exhibits no variations as wind wave energy increases, which is different with the result of Liu (1989).