

A Simplified Distribution for Nonlinear Seas

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Abstract : The exact theoretical expression describing the probability distribution of nonlinear sea-surface elevations derived from the second-order narrowband model has a cumbersome form that requires numerical computations, not well-disposed to theoretical or practical applications. Here, the same narrowband model is re-examined to develop a simpler closed-form approximation suitable for theoretical and practical applications. The salient features of the approximate form are explored, and its relative validity is verified with comparisons to other readily available approximations, and oceanic data.

Keywords : ocean waves, probability distributions, second-order nonlinearities, skewness coefficient, wave steepness

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