Abstract View

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On the Formation of Whitecaps by a Threshold Mechanism. Part II: Monte Carlo Experiments

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ABSTRACT

This paper is the second of three which seek to evaluate the hypothesis that deep water whitecapping is predictable in terms of a threshold mechanism involving the vertical acceleration.

The geometro-statistical computations of Part I of the series proceeded via direct integration of the joint probability densities for the vertical acceleration. In Part II we explore a second technique for computing whitecap statistics. This technique involves the Monte Carlo simulation of the vertical acceleration field and of the corresponding “breaking” variable field. Subsequent collation of various whitecap statistics parallels the analysis of whitecap photographs to be described in Part III.

Linear simulations for two types of JONSWAP spectra (Trials 1 and 2) and for a Pierson-Moskowitz spectrum (Trial 3) are presented. The resulting statistics, generated with limited resources, are sparse but pertinent. Significant improvement in the reliability of these statistics could be effected by using a vector processing computer.