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Numerical Simulations of Breaking Waves DOUGLAS DOMMERMUTH, THOMAS O'SHEA, KYLE BRUCKER, SAIC — The results of a set of numerical simulations of breaking waves are presented. The breaking waves are generated using a novel type of atmospheric forcing, which allows for wave breaking events characterized by strong plunging to weak spilling. The analysis of the wave breaking events consists of single point quantities, two-dimensional statistical quantities obtained by averaging, and three dimensional isocontours of instantaneous field variables. The single point quantities investigated include the kinetic and potential energies integrated over the computational volume. The effect of the atmospheric forcing on the late time asymptotic behavior of the kinetic and potential energies will be discussed. In terms of the two-dimensional statistical quantities: The use of binary and ternary averaged statistical quantities are compared, and it is found that statistics obtained by ternary averaging show better agreement with respect to the position of free surface than do those obtained by binary averaging. The amount of air entrained underneath the free surface is investigated both qualitatively and quantitatively. The three dimensional isocontours of vorticity show intense streamwise vorticity, or tubular structures, apparent during the strong plunging events.

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