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Evolution of deep-water waves under wind forcing and wave breaking effects: Numerical simulations and experimental assessment ZHIGANG TIAN, Division of Ocean Systems Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon 305-701 Republic of Korea, WOOYOUNG CHOI, Department of Mathematical Sciences, New Jersey Institute of Technology, Newark, NJ 07102 USA — The performance of wave breaking and wind forcing models on the evolution of deep-water waves is evaluated with laboratory experiments. In the experiments, non-breaking and breaking wave groups are generated by the dispersive focusing technique and different wind conditions are considered. Surface elevations are measured with high-speed imaging. For numerical studies, an eddy viscosity model is employed to simulate energy dissipation due to wave breaking. Wind forcing is modeled by introducing a pressure distribution over the water surface in the dynamic boundary condition. The models are incorporated into a wave evolution model, which is solved numerically using a pseudo-spectrum method for the evolution of the wind forced breaking wave groups. Comparisons between the experimental and numerical results and discussions of the numerical model performance will be presented.

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