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Experiments on waves under impulsive wind forcing in view of the Phillips (1957) theory LEV SHEMER, ANDREY ZAVADSKY, Tel Aviv Univ — Only limited information is currently available on the initial stages of wind-waves growth from rest under sudden wind forcing; the mechanisms leading to the appearance of waves are still not well understood. In the present work, waves emerging in a small-scale laboratory facility under the action of step-like turbulent wind forcing are studied using capacitance and laser slope gauges. Measurements are performed at a number of fetches and for a range of wind velocities. Taking advantage of the fully automated experimental procedure, at least 100 independent realizations are recorded for each wind velocity at every fetch. The accumulated data sets allow calculating ensemble-averaged values of the measured parameters as a function of time elapsed from the blower activation. The accumulated results on the temporal variation of wind-wave field initially at rest allow quantitative comparison with the theory of Phillips (1957). Following Phillips, appearance of the initial detectable ripples was considered first, while the growth of short gravity waves at later times was analyzed separately. Good qualitative and partial quantitative agreement between the Phillips predictions and the measurements was obtained for both those stages of the initial wind-wave field evolution.

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