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Experimental study of temporal evolution of waves under transient wind conditions. ANDREY ZAVADSKY, LEV SHEMER, Tel Aviv Univ — Temporal variation of the waves excited by nearly sudden wind forcing over an initially still water surface is studied in a small wind-wave flume at Tel Aviv University for variety of fetches and wind velocities. Simultaneous measurements of the surface elevation using a conventional capacitance wave-gauge and of the surface slope in along-wind and cross-wind directions by a laser slope gauge were performed. Variation with time of two components of instantaneous surface velocity was measured by particle tracking velocimetry. The size of the experimental facility and thus relatively short characteristic time scales of the phenomena under investigation, as well as an automated experimental procedure controlling the experiments made it possible to record a large amount of independent realizations for each wind-fetch condition. Sufficient data were accumulated to compute reliable ensemble averaged temporal variation of governing wave parameters. The essentially three-dimensional structure of wind-waves at all stages of evolution is demonstrated. The results obtained at each wind-fetch condition allowed to characterize the major stages of the evolution of the wind-wave field and to suggest a plausible scenario for the initial growth of the wind-waves.

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