



Laboratory study of peculiarities of the freak-wave generation

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A new wave tank for wave measurements in experimental conditions is installed in the year of 2015 in the Nizhny Novgorod State Technical University n.a. R.E. Alekseev, which is now beginning to run. In recent study series of experiments were conducted in order to reproduce analytic solutions of approximate theories in the case of strong nonlinearity. In particular experimental work is aiming to test methods of extreme wave forecasting on the background of the irregular wave field. The statistics of rogue wave heights is studied together with the statistics of rogue wave crests and rogue wave troughs.

The full length of the wave tank is 7 meters, which includes the size of the working area of 6.5 m and the rest occupies the hinged-type wavemaker. Width of the wave tank is 0.5 m and height is 1 m. The wavemaker has the amplitude in the range of 0-15 degrees and frequency in the range of 0.1 - 10 Hz. The wave tank set up contains also the basic instrumentation and video fixation system including a high-speed camera. The height of waves generated during strongly nonlinear regimes is comparable to the unperturbed depth of the water in the wave tank. In order to prevent the wave reflection from the walls laboratory facility is equipped with an effective removable louvered wave absorber, mounted on opposite end of the wave tank. Construction of wave absorber has adjustable height and tilt in order to select the most effective way of wave absorption. With this equipment conditions for different wave modes can be arranged: breaking waves, full absorption, as well as partial reflection that corresponds to different modes of wave field in the coastal zone.

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