



Laboratory investigation of intensive solitary internal wave action on surface waves

V.V. Bakhanov, N.A. Bogatov, V.I. Kazakov, O.N. Kemarskaya

Institute of Applied Physics RAS, Nizhny Novgorod, Russia (bakh@hydro.appl.sci-nnov.ru / Fax: 7-8312-365976)

The experiments were performed in the large thermost stratified tank (20m x 4m x 2m) at the IAP RAS with a controlled thermocline-type stratification which models the upper ocean structure at 1: 100 of spatial scale and about 1:10 of velocity scales. The solitary internal wave was created by local in time action on the thermocline. Parameters of internal wave were registered by a rule of hot-wire flowmeter and special high-precision acoustical Doppler sensor of fluid velocity that is capable of measuring 3 components of the flow velocity vector (Nortek). Surface currents induced by internal wave were investigated using a modified PTV (Particle Tracing Velocimetry) method. Evolution of internal wave parameters in process of propagation along tank was researched. Surface waves with opposite to internal wave direction of propagation were generated by wavemaker. For remote measurements of surface wave parameters we used a two-channel ultrasonic gauge of surface motions working in a continuous regime. A phase method was employed in this gauge.

Surface wave amplitude variability is registered as directly above solitary internal wave, and in its nearest vicinity. Dependence of surface wave variance on their frequency and amplitude is investigated. Comparison with results of corresponding theoretical calculations is carried out.

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