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An experimental research of the solitary wave interaction with the composite obstacles

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The solitary wave transformation over the slope and its action on the composite obstacle consisting from inclined, horizontal, and vertical faces were experimentally studied. The hydro flume is 40 m length, 1.0 m width, and 1.2 m height. The waves were generated by vacuum wavemaker. The wave heights were in the range from 5 cm to 35 cm. The wave from the beginning transmits over a horizontal part of the bottom, and then it spreads over the slope with the magnitude 0.02. To measure the free surface elevation there were installed 8 wavemeters. The relative height of the transformed wave as a function of the relative local depth of water was measured. Moreover the breaking-down points of the wave were found in all cases. The actions of both collapsing and non-collapsing solitary wave were studied. The pressure of the water was measured at the points of the obstacle, and the velocity of the liquid particles was measured in the vicinity of the obstacle. The strain-gauge transducers were used to record the pressure, and the hydrometric micro-propeller were applied to measure the velocity of the liquid. In basis of the results of this research a regular-style structure exposed to the minimum action was proposed.