



## **Influence of wave breaking effects on wave transformation and run-up on the beach**

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We study processes of propagation, transformation and interaction of long nonlinear waves in shallow water considering effects of wave breaking. New nonlinear effect of wave reflection is found. The reflected wave appears, when the considerably deep wave trough forms a shock wave front, and travels to the direction opposite to the incident wave. Different scenarios of nonlinear transformation and interaction of waves of different polarity are considered. Influence of wave breaking effect on its run-up is shown. Different scenarios of wave-vertical wall interactions are considered. Theoretical estimates of the wave height on the wall are given. The calculations are performed in CLAWPACK software package ([www.clawpack.org](http://www.clawpack.org)).