



Strong wave amplification on monotonic beaches

Efim Pelinovsky (1) and Ira Didenkulova (1,2)

(1) Institute of Applied Physics, Nizhny Novgorod, Russia

(pelinovsky@hydro.appl.sci-nnov.ru), Institute of Cybernetics, Tallinn, Estonia

Wave amplification on monotonic beaches of a small slope can be significant. Two bottom profiles are known as they satisfy Green's law, when the depth is in the $(-1/4)$ order for linear wave and in the (-1) order for nonlinear solitary wave. Here we demonstrate the same character of significant wave amplification even so the depth is an arbitrary (not smoothed) function of offshore coordinate. Two examples of special bottom profiles (so called non-reflecting beaches) when wave equation has a rigorous solution in the form of a traveling wave are found. The Cauchy problem for obtained wave equation is solved. It is shown that solution exists in finite time only. The reflection and transmission of the wave approaching the non-reflecting beach are studied.