Geophysical Research Abstracts
Vol. 15, EGU2013-1764, 2013
EGU General Assembly 2013

Nonlinear wave transformation in shallow water taking into account the wave breaking effect

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The nonlinear shallow-water equations are solved analytically and numerically. Analytical solution is obtained with use of Riemann invariants. Numerical simulation allows to analyze the wave formation in the source and effects of the wave breaking. Initial displacement of water level and particle velocity distribution are given in the source. The numerical solution showed that the analytical estimates are in good agreement with calculated data in a wide range of characteristics of the source, even if waves, coming from the source, break down. An application to the tsunami waves is considered.