



## **The run-up of very steep solitons on a vertical wall**

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The study reports on a series of numerical simulations based on Boundary Integral Equation Method (BIEM) on finite depth, designed to investigate the run-up of a very steep solitary wave on a vertical wall. The initial condition is numerically generated by a Tanaka solution of solitary wave. The main interest of this study is to calculate the acceleration at the free surface. This acceleration can exceed locally the gravity acceleration during the run-up. Numerical simulations are performed for different values of non-linearity parameter  $a/h$ , where  $a$  is the amplitude of initial solitary wave and  $h$  the water constant depth. For values of the parameter  $a/h$ , larger than the critical value  $(a/h) = 0.72$ , we anticipate the occurrence of an instability based on Rayleigh-Taylor mechanism. The numerical profiles corresponding to very steep waves are similar to those observed by Maxworthy (1976).

T. Maxworthy , Experiments on collisions between solitary waves , J. Fluid Mech. (1976), vol 76, part 1, pp. 177-186