

# Abstract

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## **Numerical simulation of wave overtopping using a two dimensional breaking wave model**

A two-dimensional breaking wave numerical model capable of simulating regular and irregular wave overtopping over the coastal structures is presented. The model uses the volume of fluid (VOF) algorithm to track the free surface movements. The model is based on Reynolds Averaged Navier-Stokes (RANS) equations for mean flow field and the ( $k-\epsilon$ ) equations for turbulent kinetic energy,  $k$ , and the turbulence dissipation rate,  $\epsilon$ . The results have been compared with other analytical solutions, laboratory data and design empirical formulae for wave overtopping at sloping sea walls. The comparison suggests that the current design formulae for wave overtopping in the breaking zone underestimate the overtopping discharges for the range of cases investigated.