

Abstract

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ENGINEERING STUDY FOR DESIGN OF BREAKWATER ALONG ALEXANDRIA

The phenomena of wave flooding of sloped seawalls is studied using a two dimension breaking wave numerical model which is based on the Reynolds averaged Navier-Stokes equations for the mean flow and (k, ϵ) equations for turbulent kinetic energy, k , and the turbulence dissipation rate, ϵ . The model accuracy in simulating propagation of linear and irregular waves has been evaluated in [1] and [2]. The overall performance of the model is considered satisfactory. Suggested empirical formulae for combined overtopping/overflow based on a regression analysis against the numerical model output has been introduced and illustrated. The phenomena of wave flooding happened last winter in Alexandria coastline is presented and explained. The suggested formulae will be used in attached with the numerical wave model to study these phenomena. Environmental assessments, engineering studies and designs are under progress now for inshore and offshore breakwater along Alexandria coastline. A statistical definition of storm-generated wave heights and period has been carried out. More than 3500 different waves characteristics during the last 50 years have been studied and analysed. It is expected to introduce technical solutions and estimate the amount of wave flooding in the future research.