**ABSTRACT**

Breakwaters are the protective structures constructed to maintain tranquility conditions inside the harbor. Breakwaters protect the harbors from high intensity waves and thus provides suitable environment for loading and unloading of cargo. In recent years, along with structural functionality, cost effectiveness of breakwaters is also a governing factor in breakwater design. A breakwater consisting of an emergent main breakwater with a submerged reef in front is called tandem breakwater. The submerged reef in front of the main breakwater reduces the effect of waves on the main breakwater by increasing the incident wave height followed by wave breaking. The zone between reef and conventional rubble mound breakwater, naturally dissipates the incident wave energy. The wave energy dissipation effects of the reef and conventional rubble mound breakwater enables the design of economic breakwater structures using the concept of tandem breakwaters.

Numerical modeling can be used to model various problems of real case scenario where physical modeling is difficult. The Boussinesq wave module, MIKE 21 BW, is a numerical modeling tool for studies and analysis of wave disturbances in ports harbours and coastal areas. The model includes the main physical phenomena, for example wave-wave interaction, white-capping, dissipation, refraction and shoaling

The present study deals with the application of MIKE 21 BW for prediction of transmitted wave height over submerged reef and damage level of conventional rubble mound breakwater of tandem breakwater.

*Keywords*- Tandem breakwater, submerged reef, MIKE 21 BW