Investigating Fixed Floating Breakwater Response to Waves Action Using a Simplified Analytical Model

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Abstract

The hydrodynamic behaviour of fixed floating breakwater (FFBW) is studied in the present thesis, using a simplified analytical model.

Firstly, transmission (T) coefficient was calculated by implementing the analytical model equations using MATLAB with similar wave and structure characteristics that were used by Drimer et al. (1992) for validation purpose. The comparison of T with Drimer et al. (1992) showed that the model was implemented correctly.

Secondly, comparison of T and reflection coefficient (R) values between analytical solution and existing experimental data was made. The comparison showed good agreement for a wide range of conditions. In addition, comparison between the analytical model (Drimer et al., 1992) and the analytical formula of transmission coefficient (Hales, 1981) was done.

After the comparison between the analytical and experimental results, design charts were developed using the analytical model. The charts described the variation of the coefficients along a wide range of water depth (h) over L ratio for different structure width over water depth (B/h) values for a particular draft (dr) over h ratio.

The main goal was to show how these charts can be used in designing of fixed floating breakwater. This was achieved using a solved example.