

عنوان مقاله:

Experimental and Numerical Investigation of Degree of Freedom Effects on Hydrodynamic Performance of Floating Breakwaters Under Regular Waves

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خلاصه مقاله:

In designing of any system that deals with forces and displacements some of the effective parameters on hydrodynamic behavior that needs to be investigated are the degree of freedom, and the stiffness of the support systems. In the present study, the effects of degree of freedom on hydrodynamic performance of a box type floating breakwaters (FB) is investigated experimentally and numerically. The experiments were conducted in the 2D wave flume of the (SCWMRI). Regular waves were generated by a piston type wave paddle controlled by 'DHI wave generating' software. The effect of incident waves characteristics on efficiency of FB is examined in four configurations. In this paper, a new dimensionless parameter (DB/L^2 , i.e., draft times width divided by wavelength squared) is identified as an essential parameter for comparison between theories and the experimental data. Generally, the most efficient configuration is the fixed breakwater, but considering the tidal phenomenon, providing the required draft of FB will increase the cost of project. For short wavelengths, it is seen that the efficiency of pile-restrained FB is good same as the fixed type in mild conditions. Regarding the cost-effectiveness, the configuration of the FB with the pile should be considered the most efficient for design purposes in mild conditions.

کلمات کلیدی:

Floating Breakwater, Degree of Freedom, Stiffness of Anchorage System, Hydrodynamic performance, transmission coefficient

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