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The Effect of Peak Enhancement Factor,γ, on the Stability of Breakwater

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Abstract

In this study, a series of hydraulic model experiments was conducted in order to investigate the stability of Marmara New Port Breakwater, which will be constructed between Tekirdağ and Marmara Ereğlisi in Turkey. For this aim, the cross-section of the breakwater was placed inside the wave channel of Port Hydraulic Research Center of Ministry of Transport. JONSWAP spectrum was chosen for the irregular wave experiments because of developing sea conditions at Marmara Sea. But, unfortunately, no information was obtained about peak enhancement factor 'γ' which is the one of the most important parameter of JONSWAP spectrum, at that region. Therefore, experiments were repeated for different γ values (γ =3.3, 5, 7) to see the effect of this factor on the damage ratio of breakwater, wave reflection and transmission. Moreover, the relation between γ factor and both spectrum peakedness parameter (Qp) and wave groupiness was investigated. According to results of the experiments, the higher the γ factor value, the more damage ratio is obtained. Although, no effect of γ was observed on wave reflection and wave transmission, an increase is observed in transmission especially at high γ value due to overtopping.