Wove dissipation modelling on pile breakwater using xbeach

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Abstrak

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Pile breakwater is an alternative coastal structure to prevent coastal erosion considering the economic and technical aspect. An improved design for pile breakwater is proposed here. Our goal is to develop an assessment tool in planning the implementation of pile breakwater. This tool is based on numerical model that has been verified with physical model result. The wave spectrum show that the numerical model is able to simulate the wave as same as the physical model with overestimation. It also points out that the simulation with wave period (T) = 2.5 s has more significant noise than the simulation with wave period (T) = 2 s. In general, the numerical model has high accuracy for predicting incident wave height (Hi), transmitted wave height (Ht) and transmission coefficient (KT) with error below 1 % RMSE. Xbeach is also able to simulate pile breakwater with high accuracy especially for two or three row arrangement with width gap 0.3 m. Even so, the numerical model have limitation regarding wave phase and wave through irregularity. Pile breakwater is an alternative coastal structure to prevent coastal erosion considering the economic and technical aspect. An improved design for pile breakwater is proposed here. Our goal is to develop an assessment tool in planning the implementation of pile breakwater. This tool is based on numerical model that has been verified with physical model result. The wave spectrum show that the numerical model is able to simulate the wave as same as the physical model with overestimation. It also points out that the simulation with wave period (T) = 2.5 s has more significant noise than the simulation with wave period (T) = 2 s. In general, the numerical model has high accuracy for predicting incident wave height (Hi), transmitted wave height (Ht) and transmission coefficient (KT) with error below 1 % RMSE. Xbeach is also able to simulate pile breakwater with high accuracy especially for two or three row arrangement with width gap 0.3 m. Even so, the numerical model have limitation regarding wave phase and wave through irregularity.