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Physical model investigation of one way gear ocean wave energy converter as a floating wave breaker and renewable energy sources

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To date there were few studies of wave height reduction after interacting with one way gear wave energy converter developed at Hydraulic Laboratory Hasanuddin University and Politeknik ATI Makassar Indonesia. In this work, wave height reduction after interacting with physical model of one-way gear wave energy converter under various wave conditions was investigated. Experiment was conducted at Hydraulic Laboratory of Hasanuddin University, Makassar Indonesia. The physical model of wave energy converter can be made connecting chain, gravity weight container (M_g), counter weight (M_c), rotating shaft, gear box and flywheels. This physical model has been investigated at wave tank simulator (flume) under various converter variables and wave variations. Experiment result indicated that wave height reduction is strongly determined by the number of gravity weight container that was set perpendicular to wave direction with determination coefficient of $R^2=0.9474$. However, gravity weight mass has less impact on wave height reduction with $R^2=0.0622$. In this experiment five gravity weight pairs were employed that yield cumulative wave height reduction by 35%. This preliminary result showed that the proposed one-way gear wave energy converter could be utilized as a multipurpose floating wave breaker to protect beach erosion by reducing the wave energy and converted into new source of renewable energy.

Biography

Masjono Muchtar has completed his Master's degree in Electrical and Electronic from Auckland University, New Zealand. He attended his Doctoral studies from the Department of Civil Engineering, Faculty of Engineering, Hasanuddin University, Indonesia. Currently, he is a Doctoral candidate and a Senior Lecturer at Politeknik ATIM Makassar, Ministry of Industry, Indonesia.

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