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Experimental and numerical study of a flapping tidal stream generator[1] JIHOON KIM, Korea Institute of Ocean Science and Technology, TUYEN QUANG LE, Institute of High Performance Computing in the Singapore , JIN HWAN KO, Jeju National University, PATAR EBENEZER SITORUS, Korea Institute of Ocean Science and Technology, INDRA HARTARTO TAMBUNAN, TAESAM KANG, Konkuk University — The tidal stream turbine is one of the systems that extract kinetic energy from tidal stream, and there are several types of the tidal stream turbine depending on its operating motion. In this research, we conduct experimental and consecutive numerical analyses of a flapping tidal stream generator with a dual configuration flappers. An experimental analysis of a small-scale prototype is conducted in a towing tank, and a numerical analysis is conducted using two-dimensional computational fluid dynamics simulations with an in-house code. Through an experimental analysis conducted while varying these factors, a high applied load and a high input arm angle were found to be advantageous. In consecutive numerical investigations with the kinematics selected from the experiments, it was found that a rear-swing flapper contributes to the total amount of power more than a front-swing flapper with a distance of two times the chord length and with a 90-degree phase difference between the two.

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