웨이브 에너지 컨버터의 모델링 및 분석

이연원+·난준단 파르트[1]·이규명[1]·최윤환[2]

Modeling and Analysis of a Wave Energy Convertor

Yeon Won Lee+·Nanjundan Parthasarathy[1]·Kui Ming Li[1]·Yoon Hwan Choi[2]

The energy present in ocean waves are abundant in nature. Recently researchers have been exploring ways to capture and convert this energy into useful forms (typically electrical) with the help of Wave Energy Converters (WECs). Excellent reviews in this field are available in literature, namely papers by C C Mei [1], DV Evans [2], J Falnes [3], A F de O Falcao [4] and standard textbooks by C C Mei [5], M E McCormick [6] and J Falnes [7]. Independent of the type, all WECs comprises of three fundamental parts, namely the working medium, the power converter (or the power take off) and the mooring system. The design of a WEC has to be made in accordance with the wave climate which is the key for installation locations.

In this paper, modeling of two types of WECs are taken into account from [8] and [9].Based on them, a new modeling is derived on the theory of hydrodynamics effects that introduces memory type terms into governing equations of motion, a work of Cummins [10].When the waves force the device into oscillatory motions, only heave motion is considered. Linear theory is applied. The results are compared for different parameters and conclusions are made that the new modeling extracts more energy than the models accounted for and also provides new insights on the behavior of the device. Future work includes latching control of this WEC.

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+ 이연원(부경대학교 기계자동차공학과),E-mail:ywlee@pknu.ac.kr, Tel: 051)629-6162
1 부경대학교 대학원 메카트로닉스공학과
2 부경대학교 BK21 스마트기계 사업팀