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## 潮流发电装置运动衰减特性与不规则波响应

马勇, 张亮, 由世洲

哈尔滨工程大学海洋可再生能源研究所, 哈尔滨150001

## THE TEST STUDY ON THE ATTENUATION MOTION CHARACTERISTICS AND IRREGULAR WAVES RESPONSE OF THE FLOATING TIDAL POWER GENERATION DEVICE

Ma Yong, Zhang Liang, You Shizhou

Institute of Ocean Renewable Energy System, Harbin Engineering University, Harbin 150001, China

摘要

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摘要

为了研究基于竖轴水轮机的漂浮式潮流能发电装置的运动衰减特性与不规则波响应,提出了基于船模拖曳水池的系泊试验方法,设计了试验模型和装置,构建了系泊试验平台,进行了组合模型的自由衰减试验、系泊衰减试验和系泊状态下的不规则波响应试验. 衰减试验中测量了模型的摇动衰减特性,不规则波响应试验中测量了系缆的拉力响应和组合模型的摇动响应. 试验研究得到了关于漂浮式潮流能发电装置的衰减运动特性和4级海况、0.6m/s流速时1号系缆的拉力响应以及组合模型的摇动响应. 研究可为基于竖轴水轮机的漂浮式潮流能发电装置的理论研究和工程应用提供参考和借鉴.

关键词: 潮流能 漂浮式发电装置 竖轴水轮机 衰减运动 不规则波响应 试验

Abstract:

In order to study the attenuation motion characteristics and irregular wave response of the floating tidal power generation device with vertical-axis tidal turbine, the experimental model is designed and mooring test platform is built to conduct the free attenuation test, mooring attenuation test and irregular waves response test based on the mooring trial carried out in ship model test towing tank. The model's shaking attenuation characteristics is measured in attenuation test and also the tensile response of mooring line and shaking response of the combined model are measured in irregular wave response test. Finally the attenuation motion characteristics of the floating tidal power device is acquired and the tensile response of mooring line and shaking response of combined model under the four-grade oceanic condition when the flow velocity is 0.6m/s are achieved which can provide the reference to theoretical research and engineering application of the floating tidal power device with vertical-axis tidal turbine.

Keywords: tidal current energy floating power generation device vertical-axis tidal turbine damping

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Corresponding Authors: 马勇, 博士研究生, 主要研究方向: 海洋能利用和流体力学测试技术. E-mail: mayong02@hrbeu.edu.cn Email: mayong02@hrbeu.edu.cn

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