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低轉速黑潮發電機設計與模擬分析
Design and Simulation for the Low-speed Generator in Kuroshio

阮宜雯、張繼、邱逢琛、李坤彥*、李佳翰
國立台灣大學工程科學及海洋工程學系
Yi-Wen Juan, Chi Chang, Forng-Chen Chiu, Kung-Yen Lee, Jia-Han Li
Department of Engineering Science and Ocean Engineering, National Taiwan University
kylee@ntu.edu.tw

摘要

本文提出一個最大功率 10KW 的永磁同步發電機控制系統,並運用有限元素法配合 ANSYS Maxwell 軟體來實現低轉速之外轉子設計。此實驗架構整合了最大功率點追蹤、向量控制和空間向量調變技術，最後配合 MATLAB/Simulink 模擬黑潮發電系統之設計需求。

關鍵詞：有限元素法、永磁同步發電機、最大功率點追蹤、空間向量調變技術、黑潮

Abstract

In this paper, a maximum power control system of 10KW permanent magnet synchronous generator (PMSG) is proposed. Moreover, we present a low-speed design of outer rotor based on Finite Element Method (FEM) by ANSYS Maxwell. The maximum power point tracking (MPPT), vector control, and space vector pulse width modulation (SVPWM) are integrated in this experiment. Finally, we use the MATLAB/Simulink to simulate the design requirement of power system for Kuroshio.

Keywords: finite element method, permanent magnet synchronous generator, maximum power point tracking, space vector pulse width modulation, Kuroshio