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離岸風場海象及風機結構物互制之研究
Study of the Maritime Meteorology and Wind Turbines influence each other of Offshore Wind Farms

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摘要

依據工研院綠能所研究臺灣地區風力潛能模擬分布指出，臺灣西部沿海及外島之澎湖、蘭嶼等擁有可觀之風力資源，年平均風速多可達 5~6 m/s 以上，風能密度達 250 W/m2 以上，顯示我國具有離岸式風力發電開發之潛力。惟為避免離岸風力發電開發行為對海域環境造成衝擊，須進行必要的水理分析。本研究擬嘗試於臺灣西北部之桃園觀音海域附近，基於採重力式基礎之離岸風力發電機組佈設於研究海域時，可能造成標的海域附近波、流場變化及海岸地形變遷，採二維水理模式與二維地形變遷模式，以所蒐集分析之海象資料及地形提供率定模式輸入條件，進行離岸風場附近海域的波浪、海流及地形變遷模擬計算，並進行模擬結果驗證。藉由數值模式計算結果，探討離岸風力發電機組設置後對附近海域的影響程度，並可提供後續工程建設及長期地形變遷分析之參酌。

關鍵詞：離岸風場；重力式基礎；海岸地形變遷

Abstract

Based on the simulation of wind power distribution in Taiwan, which is conducted by the office of green energy of Industrial Technology Research Institute (ITRI), the western coast of Taiwan and the offshore islands (i.e. Penghu, Lanyu, etc.) have considerable wind power resources. The annual average wind speed and wind density are mostly above 5~6 *m/s* and 250 *W/m²*, proving the potential of offshore wind power development in Taiwan. But to avoid the development activities impact on the marine environment, necessary to do hydrodynamic simulation. In this study, case in Guanyin, Taoyuan, the west-north part at Taiwan, when the offshore wind farms setting in the target area, which used the gravity foundation, may cause the wave, current and the coastal topography changes. To solve these questions, we used the 2D hydrodynamic model and topography change model to simulation, and calibration by the onsite data. By numerical model results, discuss the impact of offshore wind turbines after setting near the sea, and provides follow-up project construction and long-term analysis of the topographic changes.

Keywords: Offshore wind farms; Gravity foundation; Topography change