NREL PHASE II 風力渦輪機流場分析

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摘 要

本研究利用計算流體力學(CFD)軟體，針對美國再生能源實驗室(NREL,National Renewable Energy Laboratory)第二期(PhaseII)實驗性風力渦輪機之空氣動力特性分析。求解的數學式包含三維、暫態的 質量、動量、與能量守恆等方程式，並利用SIMPLEC數值方法進行計算。迎風面的紊流流場模擬採用 k- ε 兩方程式紊流模型以解決數學完整封閉性的問題。本文所探討的NREL第二階段風力機，其葉片乃非 扭轉、固定弦長、非對稱形翼切面作設計。數值計算結果可與實驗數據進行比對，並決定包含壓力係數 Cp(Pressure Coefficient)、扭力(Moment)、氣動功率等重要氣體動力特性。並延伸檢視風速葉片偏斜 角以及轉速效應對功率的影響，並進一步做為風車氣彈性力學分析的負載條件。

關鍵詞 : NREL PhaseIIS809，風車，機翼，計算流體力學，扭力，氣動功率

目錄

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