建國科技大學機械工程系暨製造科技研究所

科技英文

期末報告

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1. 文章標題之翻譯:

The role of tidal asymmetry in characterizing the tidal energy resource of Orkney

描述奧克尼潮汐再生能源不對稱的潮汐作用

2. 摘要內容翻譯: When selecting sites for marine renewable energy projects, there are a wide range of economical and practical constraints to be considered. from the magnitude of the resource through to proximity of grid connections. yet which has an important role in quantifying the resource. is tidal asymmetry. i.e. variations between the flood and ebb phases of the tidal cycle. Here, we present theory and develop a high-resolution three-dimensional ROMS tidal model of Orkney to examine net power output for a range of sites along an energetic channel with varying degrees of tidal asymmetry. Since power output is related to velocity cubed, even small asymmetries in velocity lead to substantial asymmetries in power output. We also use the 3D model to assess how tidal asymmetry changes with height above the bed, i.e. representing different device hub heights, how asymmetry affects turbulence properties, and how asymmetry is influenced by wind-driven currents. Finally, although there is minimal potential for tidal phasing over our study site,we demonstrate that regions of opposing flood- versus ebb-dominant asymmetry occuring over short spatial scales can be aggregated to provide balanced power generation over the tidal cycle .

在選擇海洋再生能源位置的時候，有個廣泛的經濟條件和被考慮的實際的限制情況，從再生能源通過電網連結的接近質，在潮汐再生能源位置的選擇不是常規地考慮的因素，然而具有量化的資源有著重要的作用，潮汐的不對稱，在潮汐週期的洪水和低潮期之間的變化，在這裡，我們提出的理論和發展奧克尼的高解析度三維 ROMS 潮汐模型研究淨功率輸出為某一範圍的位置沿一個有力的水道有不同程度的潮汐不對稱。由於功率輸出與速度立方體有關，即使是很小的在速度不對稱導致輸出功率大幅不對稱。我們也使用 3D 模型來評估潮汐不對稱性如何改變與高度在河床的上方，即代表不同的設計的輪轂高度，如何影響不對稱的湍流特性，以及如何由風力驅動來影響不對稱性。最後，雖然有潮汐位置在我們的研究階段有著最小的潛力，我們證明了相對的洪水範圍與相對的低潮顯現出主要的不對稱性在短空間尺度的區域是可以合計提供均衡的能量潮系週期。

3. 相關單字提示與說明:

1. renewable energy　可再生能源
2. practical constraints　實際的限制
3. resource　資源
4. flood　洪水
5. tidal cycle　潮汐週期
6. magnitude　巨大
7. asymmetry　不對稱
8. distorted　扭曲
9. propagate　傳播
10. freciesquen　頻率

4. 句型分析

1.When selecting sites for marine renewable energy projects,
時間副詞子句(時間副詞+主詞+動詞+受詞+受詞補語

2.there are a wide range of economical and practical constraints to be considered
主詞+動詞+直接受詞+介詞+間接受詞

3.Since power output is related to velocity cubed
介係詞+主詞+動詞+受詞+受詞補語

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