عنوان مقاله:

Deriving Approximate Criteria for Design and Analysis of a Novel Oscillatory Wind Turbine Using Linearization

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خلاصه مقاله:

Wind energy has become one of the most popular resources of clean energy. In spite of this popularity, there are some serious flaws in design of conventional wind turbines. Among these are the substantial limitations and drawbacks of the rotary wind turbines, which are the main industrial wind turbines. This has motivated alternative designs and strategies for wind harvesting. In this paper, an alternative oscillatory wind turbine is investigated. First, the governing equations of motion of the turbine are represented and linearized. Then, closed solutions of the linearized equations are cross-validated with numerical simulation resulted from a generated computer code. A close affinity has been observed between the numerical simulation and the analytical solution. Finally, some parametric relationships are extracted from the linearized equations of motion, to be used in design and analysis of the turbine, at least approximately.

کلمات کلیدی:

Oscillatory wind turbine, Equations of motion, Linearization, Design criteria

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