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Theoretical and numerical analysis of vortex bladeless wind turbines

- **ملخص البحث (الثانى) باللغة الإنجليزية**

Wind energy is one of the most abundant renewable energy resources that has been used to generate electricity. A new used method called Vortex Bladeless Wind Turbines which is basically a rod oscillating and vibrating in response to the vortices originating from the wind passing by the rod. This paper presents a mathematical model used in analysis the work of the VBWT. A prototype design was created using solidwork to calculate the physical properties. In addition, a numerical study was carried out using Ansys software to calculate the forces affecting the VBWT. Finally, the safety of VBWT structure is studied. The results indicated that the obtained model can be applied practically in studying the performance of general VBWT with low wind speed, as VBWT uses less space, low maintenance and hence economical. The mathematical formula of VBWT power is the function of air velocity, aerodynamic coefficients, and prototype physical properties.