Vibrations Analysis of Vertical Axis Wind Turbine

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By

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Abstract

This is a thesis concerned with Vertical Axis Wind Turbines (VAWT) and researches in Vibration. The Vertical axis wind turbines (VAWT) compared with Horizontal axis wind turbines (HAWT) has a lower efficiency. However, the supporting structure of VAWT structure is relatively simple. It is suitable in poor wind conditions. Besides, VAWT also generates lower noise and vibrations.

In this study, Finite element method is used to calculate and obtain natural Frequencies of Mechanical vibration. A simple model of Vertical Axis Wind Turbines Natural Frequencies under three conditions was used, to determine and analyse the relationship between Vibration and the shape of the Wind Turbines. This study offers a solution, that assists in analysing the vibration of Vertical Axis Wind Turbines and also provides improvements, in order to help the design and development Vertical Axis Wind Turbines. A way to reduce the vibration of the VAWT is offered in order to increase the lifetime and efficiency of Vertical Axis Wind Turbines.

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