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# MODELING STOCHASTIC WIND LOADS ON VERTICAL AXIS WIND TURBINES

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## ABSTRACT

The Vertical AXIS Wind Turbine (VAWT) is a machine which extracts energy from the wind. Since random turbulence is always present, the effect of this turbulence on the wind turbine fatigue life must be evaluated. This problem is approached by numerically simulating the turbulence and calculating, in the time domain, the aerodynamic loads on the turbine blades. These loads are reduced to the form of power and cross spectral densities which can be used in standard linear structural analysis codes. The relative importance of the turbulence on blade loads is determined.

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