

Does flexible multi-body tower Blade Coupling work in large wind turbines?

In order to investigate the dynamic response of flexible multi-body tower blade coupling in large wind turbine, this paper performed unsteady CFD simulations on the large wind turbines with different distances, using a three-dimensional model.

Do large wind turbine tower-blade coupled structures have complex modal responses?

The results indicate that the wind-induced responses of a large wind turbine tower-blade coupled structure present complicated modal responses and multimode coupling effect.

Should blade-tower coupling effect and total base shear be considered simultaneously?

To obtain more precise analysis, the blade-tower coupling effect and the total base shear of the blades should be considered simultaneously in the design of wind turbine towers. Baumgart, A., 2002. A mathematical model for wind turbine blades.

Are wind turbine tower-blade coupled systems vibration induced?

Herein, by a case study on a 5-MW wind turbine system developed by Nanjing University of Aeronautics and Astronautics, the wind field simulation and wind-induced vibration characteristics of wind turbine tower-blade coupled systems is analyzed.

How are wind turbine blades and towers simulated?

The mean wind velocity of the rotating blades and tower was simulated according to wind shear effects, and the fluctuating wind velocity time series of the wind turbine were simulated by a harmony superposition method. A dynamic finite element method (FEM) was used to calculate the wind-induced response of the blades and tower.

Does bend-twist coupling reduce fatigue load of wind turbine blades?

Bend-twist coupling intends to reduce the fatigue load of wind turbine blades. Fatigue load alleviation between 10 and 20 % have been observed in previous studies (Lobitz and Veers 2003 ; Verelst and Larsen 2010).

Based on the mutual compensation of offshore wind energy and wave energy, a hybrid wind-wave power generation system can provide a highly cost-effective solution to the increasing demands for offshore power. To ...

As shown in Fig. 1, the wind turbine is consisted of several components such as main bearing, gearbox, generator, wind meter, control cabinet, and revolving motor. The main ...

In this study, wind farms were optimized to show the benefit of coupling complete turbine design and layout

optimization as well as including two different turbine designs in a fixed 1-to-1 ratio ...

The application of flexibility theory plays a basic role in monitoring and controlling the dynamic parameters of the large-scale wind turbine tower blade coupling structure. Flexible ...

??? (floating wind turbine, FWT) ??????????????????????, ? ????????????????????? . ???????? ...

Section 2 describes the numerical simulation method of wind turbine wake including the coupling simulation model based on ... influence of nacelle and tower on the wake of a wind turbine is ...

In order to analyze the wind turbine blade-cabin-tower coupling system, this paper established the coordinate system and the kinetic equation of the system. The tower ...

Currently, many scholars have fully studied the internal and external excitation of the mechanical parts in wind turbine main drive systems. Zhou et al. 5 considered the gear ...

Wind power is one of the essential branches of renewable energy resources, and it is playing an important role in innovating energy systems and mitigating global climate change. After ...

??? : wind turbine tower structure, dynamic analysis, tapered beam, fundamental natural frequency, complex ocean environment Chinese Library Abstract: Studying and analyzing the ...

Transmission lines have the characteristics of being tall tower structures with a large span distribution of transmission lines that are sensitive to external loads such as wind ...

It is concluded that most failure incidents of the wind turbine tower are due to a combination of factors, among which extreme wind is identified as the most common. ... by the ...

PDF | On Jun 1, 2024, Li-Xin Duan and others published Dynamic response analysis of monopile CFDST wind turbine tower system under wind-wave-seismic coupling action | Find, read and ...

Because the motion of a large wind turbine coupling structure has the spatial motion characteristics of a flexible multi-body system, and in engineering applications, the mechanical ...

Large scale wind turbine tower blade coupling structure mode, shift change little, the maximum value is 6.3 mm, and waving shimmy vibration mode with intermittent oscillation ...

The results indicate that the wind-induced responses of a large wind turbine tower-blade coupled structure present complicated modal responses and multimode coupling effect. Additionally, the rotational effect would amplify ...

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