

What is the wind vibration coefficient of flexible PV support structure?

The wind vibration coefficients in different zones under the wind pressure or wind suction are mostly between 2.0 and 2.15. Compared with the experimental results, the current Chinese national standards are relatively conservative in the equivalent static wind loads of flexible PV support structure.

How wind induced vibration response of flexible PV support structure?

Aeroelastic model wind tunnel tests The wind-induced vibration response of flexible PV support structure under different cases was studied by using aeroelastic model for wind tunnel test, including different tilt angles of PV modules, different initial force of cables, and different wind speeds.

Do flexible PV support structures deflection more sensitive to fluctuating wind loads?

This suggests that the deflection of the flexible PV support structure is more sensitive to fluctuating wind loads compared to the axial force. Considering the safety of flexible PV support structures, it is reasonable to use the displacement wind-vibration coefficient rather than the load wind-vibration coefficient.

Do flexible PV support structures have resonant frequencies?

Modal analysis reveals that the flexible PV support structures do not experience resonant frequencies that could amplify oscillations. The analysis also provides insights into the mode shapes of these structures. An analysis of the wind-induced vibration responses of the flexible PV support structures was conducted.

How does wind pressure affect a flexible PV support structure?

When the flexible PV support structure is subjected to wind pressure, the maximum of mean vertical displacement occurs in the first rows at high wind speeds. The shielding effect greatly affects the wind-induced response of flexible PV support structure at $\alpha = 20^\circ$.

Are flexible PV support structures prone to vibrations under cross winds?

For aeroelastic model tests, it can be observed that the flexible PV support structure is prone to large vibrations under cross winds. The mean vertical displacement of the flexible PV support structure increases with the wind speed and tilt angle of the PV modules.

The wind-induced response and vibration modes of the flexible photovoltaic (PV) modules support structures with different parameters were investigated by using wind tunnel based on elastic ...

Du Hang, Xu Haiwei, Zhang Yuelong, et al. Wind pressure characteristics and wind vibration response of long-span flexible photovoltaic support structure. Journal of Harbin Institute of ...

Aly and Bitsuamlak (2013) and Aly (2016) investigated the effects of geometric scale and wind characteristics

on the wind pressure coefficient of PV modules and found that ...

Through a rigid model wind tunnel pressure experiment, Du et al. [26] found that under different wind directions, the mean and pulsating wind pressure distribution of long-span ...

MORE Long-span flexible photovoltaic support structures have been increasingly used because of their good site adaptability and economy. For improving the wind resistance design method of ...

The wind load is a critical factor for both fixed and flexible PV systems. The wind-induced response is also one of the key concerns. Existing research mainly concentrates ...

on the wind pressure test of the rigid model, -dimensional windthe threeinduced- vibration characteristics of the photovoltaic module were investigated using finite element simulation ...

GB50009-2012 [24]), which is a non-dimensional coefficient and can be estimated thus, $(6) v = 1 + P_e / P_m$ where P_e is the equivalent static wind load considering the dynamic effects of wind ...

The wind vibration coefficients in different zones under the wind pressure or wind suction are mostly between 2.0 and 2.15. Compared with the experimental results, the current Chinese ...

As the solar panel tilt angle increases from 0° to 60° , the support reaction wind-induced vibration coefficient (v_{zf}) ranges from 1.07 to 1.67, and the displacement wind ...

Transient analysis was used to determine the photovoltaic bracket wind vibration coefficients under normal operating settings from the results of the wind tunnel tests. Finally, the wind load ...

Buildings 2024, 14, 1677 3 of 23 2.2. Model Overview In this study, the flexible support PV panel arrays under flat and mountainous conditions consist of 8 rows and 12 columns, totaling 96 ...

Double-row flexible photovoltaic support is a new type of structure that has excellent site adaptability and cost-effectiveness. However, methods for calculating wind loads ...

Wind tunnel tests on an aero-elastic model of a 41.6×29.8 m flexible PV array system were conducted to investigate its wind-induced vibration characteristics. Test parameters included ...

Considering the safety of flexible PV support structures, it is reasonable to use the displacement wind-vibration coefficient rather than the load wind-vibration coefficient. For the flexible PV arrays with wind-resistant cables ...

Wind pressure characteristics and wind vibration response of long-span flexible photovoltaic support structure.



Flexible photovoltaic bracket wind vibration coefficient

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