

What is a flexible photovoltaic (PV) system?

Author to whom correspondence should be addressed. Photovoltaic (PV) system is an essential part in renewable energy development, which exhibits huge market demand. In comparison with traditional rigid-supported photovoltaic (PV) system, the flexible photovoltaic (PV) system structure is much more vulnerable to wind load.

How does wind load affect PV systems?

Wind loading is a crucial factor affecting both fixed and flexible PV systems, with a primary focus on the wind-induced response.

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.

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 $\alpha = 20^\circ$.

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.

Why are flexible PV mounting systems important?

Traditional rigid photovoltaic (PV) support structures exhibit several limitations during operational deployment. Therefore, flexible PV mounting systems have been developed. These flexible PV supports, characterized by their heightened sensitivity to wind loading, necessitate a thorough analysis of their static and dynamic responses.

Flexible photovoltaic (PV) support structures are limited by the structural system, their tilt angle is generally small, and the effect of various factors on the wind load of flexibly ...

For the ground-mounted photovoltaic array, Warsido et al., Kurt Strobel et al., and Chowdhury M. J. et al. [1,2,3] experimentally investigated the wind loads of photovoltaic arrays mounted on the ground and found that ...

This study involves the development of a MATLAB code to simulate the fluctuating wind load time series and the subsequent structural modeling in SAP2000 to evaluate the safety performance of flexible PV ...

Experimental study on wind load influencing factors of flexible support photovoltaic modules. *Acta Energiae Solaris Sinica*, 2021, 42(11): 10-18 (in Chinese) doi: 10.19912/j.0254-0096.tynxb.2019-1184

Currently, research on wind load for solar PV systems, both domestic and foreign, primarily focuses on traditional fixed brackets. There is limited research on the wind load of flexibly supported PV modules, and the ...

Flexible Solar Panel Mounting System. The flexible photovoltaic support originates from the roof of suspension structure and glass curtain wall. It is a photovoltaic support system supported by ...

However, solar energy faces practical problems such as low solar energy utilization rate and extreme weather damage. Therefore, to improve the utilization rate of solar energy, based on ...

Flexible photovoltaic (PV) support structures are limited by the structural system, their tilt angle is generally small, and the effect of various factors on the wind load of flexibly supported PV panels remains unclear. In ...

This paper aims to analyze the wind flow in a photovoltaic system installed on a flat roof and verify the structural behavior of the photovoltaic panels mounting brackets. The study is performed ...

In this paper, we mainly consider the parametric analysis of the disturbance of the flexible photovoltaic (PV) support structure under two kinds of wind loads, namely, mean ...

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