

What are the dynamic characteristics of photovoltaic support systems?

Key findings are as follows. Dynamic characteristics of tracking photovoltaic support systems obtained through field modal testing at various inclinations, revealing three torsional modes within the 2.9-5.0 Hz frequency range, accompanied by relatively small modal damping ratios ranging from 1.07 % to 2.99 %.

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.

What is a large-span flexible PV support structure?

Proposed equivalent static wind loads of large-span flexible PV support structure. Flexible photovoltaic (PV) support structure offers benefits such as low construction costs, large span length, high clearance, and high adaptability to complex terrains.

Can photovoltaic support systems track wind pressure and pulsation?

Currently, most existing literature on tracking photovoltaic support systems mainly focuses on wind tunnel experiments and numerical simulations regarding wind pressure and pulsation characteristics. There is limited research that utilizes field modal testing to obtain dynamic characteristics.

What are the dynamic characteristics of the tracking photovoltaic support system?

Through processing and analyzing the measured modal data of the tracking photovoltaic support system with Donghua software, the dynamic characteristic parameters of the tracking photovoltaic support system could be obtained, including frequencies, vibration modes and damping ratio.

Why is a photovoltaic support system prone to torsional vibrations?

Due to the lower natural frequencies and torsional stiffness, the system is susceptible to significant torsional vibrations induced by wind. Currently, most existing literature on tracking photovoltaic support systems mainly focuses on wind tunnel experiments and numerical simulations regarding wind pressure and pulsation characteristics.

photovoltaic (PV) solar power plant projects, PV solar panel (SP) support structure is one of the main elements and limited numerical studies exist on PVSP ground mounting steel frames to ...

For PV support structures, the most critical load is the wind load; the existing research only focuses on the panel inclination angle, wind direction angle, body type coefficient, geometric scale, shielding effect, ...

A methodology to assess the dynamic response and the structural performance of floating photovoltaic systems. Author links open overlay ... Structural analysis highlights the ...

Liu et al. investigated on the wind-induced and critical wind speed of a 33-m-span flexible PV support structure by means of wind tunnel test on the elastic model. The effectiveness of three different types of stability ...

The results show that: (1) according to the general requirements of 4 rows and 5 columns fixed photovoltaic support, the typical permanent load of the PV support is 4679.4 N, the wind load being 1 ...

The concept of flexible PV support structure was first introduced by Baumgartner ... to diagnose the wind load characteristics on structures [22–24]. ... the performance of the flexible PV ...

and 5 columns fixed photovoltaic support, the typical permanent load of the PV support is 4679.4 N, the wind load being 1.05 kN/m², the snow load being 0.89 kN/m² and the seismic load is ...

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 ...

The flexible PV support structure is prone to large deformation and wind-induced vibration under wind load. ... Ding H., Jing H. Q., et al, 2021. Mechanical characteristics of a new type of cable ...

This investigation explores the dynamic response and interaction mechanism of a photovoltaic support structural platform (SSP) equipped with a TLCD by experimental and ...

The results show that: (1) according to the general requirements of 4 rows and 5 columns fixed photovoltaic support, the typical permanent load of the PV support is 4679.4 N, ...

The dust on the surface of the PV panel is mainly small particles common in the atmosphere, mainly from desert storms, construction waste, industrial waste gas, volcanic ...

Previous studies focus on the wind load characteristics of roof- or ground-mounted PV structures. Cao et al. [1], Warsido et al. [2], Naeiji et al. [3], Stathopoulos et al. [4], ...

This paper analyzes the wind pressure distribution characteristics of large-span flexible PV support arrays using self-designed rigid body pressure measurement wind tunnel ...

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