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Remote observation of solar power generation

Overview

Can solar photovoltaic power generation be mapped using open satellite data?

Author to whom correspondence should be addressed. Solar photovoltaic (PV) power generation is a vital renewable energy to achieve carbon neutrality. Previous studies which explored mapping PV using open satellite data mainly focus in remote areas. However, the complexity of land cover types can bring much difficulty in PV identification.

Why is remote sensing important for solar photovoltaics in China?

Solar photovoltaics (PV) are rapidly expanding in China as a popular renewable energy technology. Medium resolution remote sensing (RS) plays an important role in monitoring the spatial distribution of PV. As China is a country with vast and diverse landscapes, the classifier trained in small areas may have poor performance, to a large extent.

Does a high-resolution global assessment of rooftop solar photovoltaics potential exist?

Yet, only limited information is available on its global potential and associated costs at a high spatiotemporal resolution. Here, we present a high-resolution global assessment of rooftop solar photovoltaics potential using big data, machine learning and geospatial analysis.

Can remote sensing be used to detect PV in diverse landscapes?

However, the complexity of land cover types can bring much difficulty in PV identification. This study investigated detecting PV in diverse landscapes using freely accessible remote sensing data, aiming to evaluate the transferability of PV detection between rural and urbanized coastal area.

What are the inputs of a solar radiation model?

The inputs of the model include solar radiation (either from ground observation or satellite remote sensing) and surface meteorological data.

Independent validation of the model at Chinese stations and globally distributed stations demonstrates its effectiveness and generality.

How can we estimate energy output from solar PV modules?

On the basis of the derived spatial PV distribution, it is also possible to use PV potential models combined with other input parameters such as solar radiation [49, 50], cloudiness , and rooftop areas to estimate energy output from PV modules and assess their contribution for carbon neutrality.

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Variation of surface solar radiation components from 2016 to ...

Satellite observation is an important tool for studying global or regional solar radiation (Shao et al., 2024).The introduction of satellite remote sensing technology has effectively supplemented the ...

Research on Photovoltaic Power Generation ...

Under the action of waves, a small unmanned surface vehicle (USV) will experience continuous oscillation, significantly impacting its photovoltaic power generation system. This paper proposes a USV ...

Power generation evaluation of solar photovoltaic systems using

Due to the implementation of the "double carbon" strategy, renewable energy has received widespread attention and rapid development. As an important part of renewable energy, solar ...

Data Augmentation-Based Estimation of Solar ...

The inputs of the model include solar radiation

(either from ground observation or satellite remote sensing) and surface meteorological data. Independent validation of the model at Chinese stations and globally ...

Data Augmentation-Based Estimation of Solar ...

Solar energy is a clean and environmentally friendly energy source [], and it is expected to account for the largest share of global renewable energy by 2040 [] tailed knowledge of both solar radiation and radiation ...

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