

How many solar radiation stations are there in China?

For daily direct horizontal and diffuse radiation, we used data collected from 64 of the stations between 1961 to 1990 because of these only 17 stations remained in operation for the collection of daily direct and diffuse radiation data after the adjustment of solar radiation measurement network in China starting 1991.

What is the average solar radiation intensity in China?

Figures 9 a and 9 b show that the annual average DGSR ranges from 6 to 26 MJ/m², with a national-average value of 15.55 MJ/m² during 2013-2014. Spatial differences are evident across China, indicating that the solar radiation intensity in northern China (western China) is higher than that in southern China (eastern China).

Is solar radiation a topic in China?

Therefore, solar radiation is a topic that has attracted broad and increasing attention in China (Che et al., 2005; Sun et al., 2016; Li et al., 2017; Wang et al., 2016; Song et al., 2019; Tang et al., 2016, 2018; Liu et al., 2019; He & Wang et al., 2020).

When did solar radiation change in China?

Li et al. analyzed averaged annual daily departures in solar radiation from 1976 to 1990 at 55 stations in China while Zhang et al. studied changes in solar radiation between 1961 and 2000 at three Chinese stations in the Yangtze Delta Region.

Are solar energy resources a potential resource in China?

In addition, the potential of solar energy resources was also assessed using cluster analysis method. The results revealed an upward trend in different components of solar radiation across most of China, with shortwave radiation exhibiting a significantly negative correlation with PM 2.5 concentrations ($R = -0.91, p < 0.05$).

What are the Interannual trends of diffuse solar irradiation in China?

Over China, the interannual trends of DSR from 1982 to 2020 are depicted in Fig. 8. Overall, the mean annual diffuse solar irradiation varied from 72.3 to 81.8 W m⁻², exhibiting an overall decreasing trend of -0.012 W m⁻² yr⁻¹. More specifically, the figure delineates five periods with characteristic trends.

Solar radiation is the Earth's primary source of energy and has an important role in the surface radiation balance, hydrological cycles, vegetation photosynthesis, and weather ...

The surface solar radiation in Eastern China, Central China and part of North China decreased even more sharply than west of China. Thicker aerosol optical depth was with larger trend of the surface solar radiation ...

The average surface solar radiation (SSR) series over China in 1971-2016 derived from the SSR data at 56 stations analyzed in this study. The aging equipment (1971-1989), replacement instrument (1990-1993) and

without human interference (1994-2016) periods are represented by red, blue and black lines, respectively. ... (Table. 1 and ...

Diffuse solar radiation (DR) is a crucial element of total solar radiation (TR), deviating from the original solar radiation direction and reaching the ground after scattering or reflection by air molecules and atmospheric particles (Chen et al., 2019). Spatially continuous and high-temporal-resolution DR data hold significant socioeconomic and scientific value.

The urgent global focus on renewable energy underscores the necessity of shift towards renewable energy sources like solar and wind power [1]. Solar photovoltaic (PV) energy is expected to surpass coal capacity by 2027 due to its cost-effectiveness [2], [3], making it pivotal in this transition in a's pledge to carbon peaking by 2030 and carbon neutrality by ...

In recent years, China has experienced a significant surge in the utilization of solar energy, and this trend is projected to continue as the country strives to achieve its "dual carbon" goals, which refers to the objectives of peaking carbon dioxide emissions before 2030 and achieving carbon neutrality by 2060 (Xiao et al., 2022). Accurate simulation and prediction ...

Global solar radiation (R_s) is a key parameter for determining the energy yields of solar photovoltaic (PV) systems. However, long-term R_s data are not available in most regions of China, impeding the management and development of PV systems. In this study, a novel model for estimating R_s was developed and coupled with a PV power model and inverse distance ...

Solar radiation forecasting is the basis of building a robust solar power system. Most ground-based forecasting methods are unable to consider the impact of cloud changes on future solar radiation. To alleviate this limitation, this study develops a hybrid network which relies on a convolutional neural network to extract cloud motion patterns from time series of satellite ...

ation over China. A preliminary study of the solar radiation data collected at three observation stations in the Yangtze River Delta Region was done by Zhang et al. (2004), and a decreasing trend of surface solar radiation was found between 1961 and 2000. Che et al. (2005) analyzed the variations in annual mean solar radiation data collected ...

A comprehensive understanding of the relationship between atmospheric circulations and variations in surface solar radiation (SSR) is important for effectively utilizing ...

Che et al. (2005) evaluated China's solar radiation data from 1961 to 2000; they found that the total radiation had decreased significantly (4.5 W m^{-2} per decade), ... According to the ground observation records (Table 2), the rainfall at the Xiaotang area is mainly concentrated in summer, with a total of 37 days. The occurrence of ...

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