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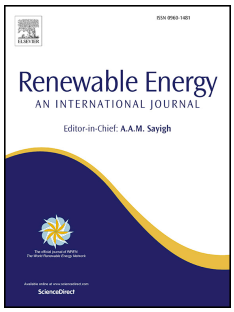

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GENERATION OF THE SITE-ADAPTED CLEAREST-SKY YEAR OF DIRECT NORMAL IRRADIANCE FOR SOLAR CONCENTRATING TECHNOLOGIES

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ABSTRACT

Concentrating photovoltaic and thermoelectric solar facilities base their operation on collecting the direct component of solar radiation. Given that the direct beam that reaches the Earth's surface varies greatly in time and space, it is common to assist the bankability of projects with a solar resource assessment. Sun-tracking collector plants are typically examined via a time series analysis of measured weather data and test reference years. Such analysis, which considers the eventual presence of clouds, may be complemented with the use of the synthetic clear-sky year assuring the maximum theoretical availability of direct normal irradiance at a site. This work introduces for the first time the concept of site-adapted clearest-sky year (CSY) and provides a methodology for its generation. Three methods to build the CSY and one algorithm to detect clear-sky moments are proposed.

KEY WORDS

Direct normal irradiance, clear-sky year, concentrating photovoltaics, concentrating solar power, solar resource assessment.