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INFLUENCE OF SOLAR ACTIVITIES ON CLIMATE CHANGE

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Abstract

The solar energy received by the atmosphere of the Earth is universally distributed, which constitutes the atmospheric dynamics. The changes observed in the climate of the Earth are due to solar output variations. Some detailed reviews have accounted for the influence of solar activities on the climate using sunspot number derived from peak Sun hours, but has gaps in analyzing critical statistical background information, seasonal, latitudinal and solar activity year validation. A number of statistical concepts are explained in order to enhance our scientific knowledge of climate response to solar activity variation. The influence of geomagnetism to climate response is also examined. This review will serve as analysis and research methodology discourse which could be an application of scientific method. Additionally, this review discusses the influence of the solar activity on climate change based on the existing literature, by focusing on solar activities other than sunspot number alone. Here, we also validate methods using forward and inverse modeling, mean percentage difference, and relative variability. Results indicated that the total solar irradiance (TSI) has remained the main focus of Sun-climate interaction with somewhat negligent on energetic particle precipitation resulting from geomagnetic disturbance reaching the atmosphere. However, statistical concept remains asset to investigate the solar activity influence on climate in both local and global latitudes. We therefore recommend provision of solar quantities data to researchers for further study.

Key words: climate change, geomagnetic latitude, energetic particles, solar influence, total solar irradiance

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