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Impact of solar activity on extreme weather and climate events

Ziniu Xiao and Liang Zhao
(xiaozn@lasg.iap.ac.cn)

Extreme weather and climate events are the result of interaction of multiple scale anomalous signals. Solar activity presents a remarkable 11-year cycle, which is an important decadal background affecting the occurrence of extreme weather and climate events. A lot of study works show that the periodic variation of solar activity has a modulating effect on the ocean-atmosphere system. The decadal variation of major atmospheric and oceanic modes, such as ENSO, has a phase-locked relationship with the periodic variation of solar activity. A significant solar footprint can be found in the tropical Pacific and the North Atlantic. The analysis shows that the solar activity also modulates the regional temperature, precipitation and typhoon activity as well.