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Geoeffective solar variability influence on Northern Hemisphere surface temperature

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The complex interaction of the solar outputs such as electromagnetic radiation, solar wind and interplanetary magnetic field with terrestrial environment would affect the Earth's climate. Usually, the effect of solar variability on climate is taken into account only through changes in solar total and spectral irradiance. In this study, possible climatic effects related to geoeffective solar variability were investigated by means of long-term statistical correlations between surface air temperature and solar/geomagnetic indices. The data from NCEP/NCAR reanalysis database for the Northern Hemisphere have been processed. Spectral analysis indicates the occurrence of periodicities between 2 and 7 years, associated to atmospheric phenomena, and periodicities around 11 and 22 years, normally associated to solar variability. By applying simple filtering procedures we can get the 11 and 22-year signals in our temperature data. Various features of these signals will be discussed on different spatial scales of the Northern hemisphere. The differences between observed and reanalysed data will be also discussed.