



Long-term timescale interactions between solar/geomagnetic activity and European climate

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The temporal behaviour of the Sun-Earth system is studied on long-term timescales such as Schwabe and Hale solar cycles (11-yr and 22-yr). Solar/geomagnetic variability as external natural forcing on European terrestrial climate is investigated in this study, by means of long-term statistical correlations between climate parameters (surface air temperature and precipitations) and solar/geomagnetic indices at local and regional scales. An attempt to apply a nonlinear approach, namely detrended fluctuations analysis (DFA), to the daily surface air temperature time series from several stations, using sliding windows of different sizes, is made. We find that scaling exponents and scaling regimes change in time and vary from one location to the other. The temporal and spatial changes in long-range correlations are significant compared to the 95% certainty intervals for the scaling exponents.