



## **ERA-40 surface solar radiation and cloudiness variability in Europe and their connection with atmospheric circulation patterns**

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This work presents seasonal variability of surface solar radiation and cloud cover (at high, medium and low levels) over Europe, provided by the Reanalysis ERA-40, and their relations with atmospheric circulation patterns or teleconnections during the 1948-2002 period. Due to the current uncertainty in the explanation and quantification of aerosols/clouds contribution to the dimming/brightening phenomena, it seems important to analyze their relationships to the main circulation patterns in order to detect possible changes in atmospheric dynamics linked with the trends in surface solar radiation and/or cloudiness during the last decades. Teleconnection patterns related to the ERA-40 fields have been obtained by using: 1) conventional indices that simplify the well-known spatial structure of pressure systems such as the El Niño/Southern Oscillation (ENSO), North Atlantic Oscillation (NAO) or Western Mediterranean Oscillation (WeMO); 2) canonical correlation analysis, by using the NCEP/NCAR reanalysis sea level pressure (SLP) and 500 hPa geopotential height as the predictor variables and the surface solar radiation or cloudiness variables as the predictand variables. The results show the important role of the NAO and blocking situations during the wintertime over Europe with interesting relationships with ENSO and WeMO during the autumn season. The results in some Mediterranean areas show that are few coincidences with those results found with precipitation in previous works.