



## **Impact of climate change on an objective circulation type classification**

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An objective climatic classification of the winter atmospheric circulation for the Euro-Atlantic region is applied to the ERA40 (European Centre for Medium-Range Weather Forecasts) Reanalysis dataset and simulations of the Canadian Climate Modeling Centre (CCCma) to explore how anthropogenic climate change may affect some circulation features, mainly changes in frequency of occurrence and mean lifetime of the circulation types (CTs).

The climate simulations comprise a control run (1961-1990) obtained with the Second Generation Coupled Global Climate Model (CGCM2) of the CCCma and a (2071-2100) integration, the latter forced by the Intergovernmental Panel on Climate Change (IPCC) SRES-A2 emissions scenario.

Principal Component Analysis (PCA) in T-mode on daily 500-hPa geopotential height data followed by a Varimax rotation has been applied to obtain the CTs. The CGCM2 CTs corresponding to the control simulation exhibit a larger persistence and small number of 1-day events than ERA40, the range of frequencies of occurrence being also larger than for ERA40. The CTs corresponding to the CGCM2 SRES-A2 (2071-2100) simulation shows an increase in the number of 1-day events and in the range of relative frequencies of occurrence with respect to the control integration. The mean lifetime varies from 2 days to 4.8 days while for the CTs in ERA40 vary from 2.4 days to 3.9 days.