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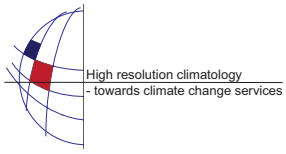

Trend and variability of Northern Hemisphere Teleconnection Indices simulated with CMIP3

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Teleconnection patterns and their links with regional climate could be modified under warmer conditions. Therefore, it is of great interest to investigate how global climate models are able to simulate the teleconnection indices. In particular, we will show results for the following teleconnection indices: North Atlantic Oscillation (NAO), East Atlantic (EA), East Atlantic/Western Russia (EA/WR) and the Escandinavia (SCAND), that affect climate variations over Europe as demonstrated in previous work. The first step in this investigation is to determine the teleconnection indices (TI) from the geopotential at 500 hPa dataset of Global Climate Models of the World Climate Research Program Coupled Model Intercomparison Project phase 3 (WCRP CMIP3). Among the different methods to derive the TI, we used the procedure followed in the Climate Prediction Center (CPC). This method is based on partial least squares regression, where predictor variables are the Northern Teleconnection Patterns, calculated by CPC using Rotated Empirical Orthogonal Functions, and the response variables are monthly mean standardized 500 hPa geopotential anomalies of model data. The regression coefficients associated with predictor variables correspond to the TI. Then, we compare these patterns derived from different models and two experiments, 20th century (20C3M) and 21st (A1B), with ones provided by CPC. The comparison of the NAO, EA, EWR and SCA simulated and observed is performed by computing the spatial correlation, spectral analysis and trends. We also obtain the probability density functions to determine if there are preferred regimes in the simulated indices against the observed ones.