



Temperature variability in former Czechoslovakia and its relationship to modes of low-frequency circulation variability

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Variability of maximum and minimum temperatures at 21 stations in the Czech Republic and 12 stations in the Slovak Republic is analysed for the last fifty years. The amplitude of the annual cycle of both temperatures rises with increasing distance from the Atlantic Ocean and declines with growing elevation.

To describe the relationship between circulation and temperatures, low-frequency variability modes are correlated with monthly mean maximum and minimum temperatures at all stations. Applying the orthogonal rotated principal component analysis on the Northern Hemisphere NCEP /NCAR reanalysis of 500-hPa heights for the period 1958-1998, we obtained four circulation variability modes over the Euro-Atlantic sector in all seasons (following the nomenclature used in Barnston and Livezey (1987) they are North Atlantic Oscillation pattern, the East Atlantic pattern, and two Eurasian patterns). The position of the action centres of modes is essential for the sign and magnitude of the correlations between the modes and temperatures in different regions of the study area. The advection and synoptic processes related to large-scale circulation are decisive for the temperature variability during the whole year. Processes of regional scale (radiation and elevation effects) have less influence and determinate to a greater extend minimum temperatures in comparison with maximum temperatures.