



Correlations of circulation variability modes with climate elements in the Czech Republic

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The low-frequency time variations of the Northern Hemisphere 500-hPa heights have been investigated using the orthogonal rotated principal component analysis applied to the data provided by the NCEP/NCAR reanalysis for the period 1958-1998. Monthly anomalies are analyzed, and separate analyses are conducted for individual seasons. Four modes are found over the Euro-Atlantic sector in all seasons. The major modes relevant to the climate in the Euro-Atlantic sector are described in detail. Their relations with monthly means / totals of 11 climatic elements in the Czech Republic are examined using correlation coefficients, separately for each season. The climatic elements include daily mean, minimum and maximum temperature, daily temperature range, precipitation probability and amount, zonal and meridional wind components, relative humidity, cloudiness, and sunshine duration. The emphasis is put on winter and summer. We demonstrate that the effects of the circulation modes on surface climatic elements may vary considerably throughout the year, and that the modes themselves undergo pronounced seasonal changes in their position and geographical extent. The work is supported by the Czech Science Foundation, project 205/05/2282.