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Variability of precipitation in northern Serbia

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Precipitation variability in northern Serbia (Vojvodina) is examined by means of the Empirical Orthogonal Functions (EOF), trend and the spectral analysis. For this purpose, monthly precipitation sums from 92 stations in Vojvodina during the period 1946-2006 were analyzed. It is obtained that the first EOF pattern for the annual and seasonal precipitation is characterized by a homogeneous positive value over the whole region with higher values over the mountains. The first set of EOFs explains from 68.8% (in summer) to 85.4% (in winter) of the total variance. The similarity of EOF1 with the mean field is confirmed.

The time series associated with the first EOF pattern (PC1) reveals decreasing trend in the winter and spring precipitation amounts, and an increase of precipitation during the summer and autumn. All of the analyses conducted were coherent in demonstrating that annual, winter and autumn precipitation in Vojvodina is influenced by the NAO. An intensification of the positive phase of the NAO could be one of the causes of the observed decrease in precipitation in Vojvodina. We did not find significant correlations between this mode and known teleconnection patterns during the summer.

The power spectra of the precipitation PC1 show statistically significant oscillations of 3.3 years during the spring, and about 8.6 and 15 years during the winter. Our findings are consistent with the quasi-periodic oscillations reported in other studies on fluctuations of European precipitation.