



Analysis of 500 hPa geopotential height field anomalies in the Atlantic-European region

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The aim of this paper is to examine the anomalies of the 500 hPa geopotential height fields in the Atlantic-European region and their effects to regional scale processes, especially for the Carpathian Basin (e.g., long lasting droughts, storms with extreme precipitation, etc). The 500 hPa geopotential height field anomalies have crucial role in the predictability of atmospheric blocking events. Blockings are anomalous features of the upper tropospheric flow. During these events the usual zonal westerly flow is interrupted by strong and persistent meridional flow causing quasy-stationary, stationary or retrograde synoptic motions in the troposphere. These atmospheric formations are generally associated with extreme weather events.

In this paper, the different kinds of blocking events are analysed using several types of blocking index methods, which are based on the magnitude of geopotential height field gradient. The frequency and persistence of different geopotential height field anomalies over the Atlantic-European region are examined using daily averaged gridded ECMWF ERA-Interim (1979-2017) and ERA-20C (1900-2010) reanalysis data. In addition, the results of climate model simulations (MPI, GFDL) are compared to the reanalysis datasets.