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The Classification of Troposphere Circulation Patterns Corresponding to Blocking Anticyclone Situations in the Atlantic-European Sector

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A catalog of stationary anticyclones in the Euro-Atlantic region for period from 1949 through 2007 developed in Russian Institute of Hydrometeorological Information (RIHMI-WDC) and Hydrometeorological Centre of Russia was analyzed. This catalog is created from analysis of daily synoptic charts and contains information about the time of persistence of stationary anticyclones, localization, maximum pressure value in the center of anticyclones at surface and 500 hPa level. The classification of blocking anticyclones in the Atlantic-European sector and analysis of large-scale circulation in the lower and middle troposphere prior and after to the formation and of blocking anticyclones for the classes were carried out. As the criteria for similarity used for fields of H500, H1000 and T850 in the objective classification, the Euclidian distance and correlation coefficients were used. As a result, it was found that the optimal number of blocking anticyclone classes is equal to 10. A regionalization of anomalies of the temperature and pressure regime in the European part of Russia for each class of blocking anticyclones has also been performed. It was found that there is a good agreement between the fields of T850 anomalies and flows in the middle troposphere. In the areas of potential block in the lower troposphere, the preceding formation of dipoles of heat and cold were revealed. Reformation of T850 fields after decay of the block occurs slowly during the period of up to 6 days. Preliminary analysis showed that the classified types of H500, H1000, and T850 fields preceding the blockings contain prognostic information about subsequent changes in the thermobaric regime during the blocking and within a few days after the destruction of the anticyclone.

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