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Extreme regimes of atmospheric circulation and their role in the formation of temperature and precipitation fields in the Arctic region

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In the present study, the extreme regimes of atmospheric circulation in the Northern Hemisphere as well as their role in the formation of monthly and seasonal anomalies of temperature and precipitation fields over Arctic region were examined using NCEP / NCAR-2 reanalysis data. To identify extreme modes, climate indexes were quantitatively assessed. The mapping of monthly and seasonal temperature and precipitation fields for the different phases of indices using composite analysis was developed. It is allowed to identify allocated geographic areas in which the influence of modes of circulation for temperature and precipitation fields in Arctic is statistically significant. Quantitative estimations of contingency of atmospheric circulation modes in the Northern Hemisphere were analyzed. Special attention has been paid to the extreme episodes of the climate circulation indices, associated with formation of significant anomalies of air temperature and precipitation. The results of numerical experiments to reproduce the extreme events on monthly and seasonal time scale on the basis of the global semi-Lagrangian model SL-AV, developed in collaboration of Institute of Numerical Mathematics and Hydrometeorological Centre of Russia, have been discussed.
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