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# A Study of Subseasonal Predictability of the Atmospheric Circulation Low-frequency Modes based on SL-AV forecasts

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The subseasonal predictability of low-frequency modes and the atmospheric circulation regimes is investigated based on the using of outputs from global Semi-Lagrangian (SL-AV) model of the Hydrometcentre of Russia and Institute of Numerical Mathematics of Russian Academy of Science. Teleconnection indices (AO, WA, EA, NAO, EU, WP, PNA) are used as the quantitative characteristics of low-frequency variability to identify zonal and meridional flow regimes with focus on control distribution of high impact weather patterns in the Northern Eurasia. The predictability of weekly and monthly averaged indices is estimated by the methods of diagnostic verification of forecast and reanalysis data covering the hindcast period, and also with the use of the recommended WMO quantitative criteria. Characteristics of the low frequency variability have been discussed. Particularly, it is revealed that the meridional flow regimes are reproduced by SL-AV for summer season better comparing to winter period. It is shown that the model's deterministic forecast (ensemble mean) skill at week 1 (days 1–7) is noticeably better than that of climatic forecasts. The decrease of skill scores at week 2 (days 8-14) and week 3( days 15-21) is explained by deficiencies in the modeling system and inaccurate initial conditions. It was noticed the slightly improvement of the skill of model at week 4 (days 22-28), when the condition of atmosphere is more determined by the flow of energy from the outside. The reliability of forecasts of monthly (days 1-30) averaged indices is comparable to that at week 1 (days 1-7). Numerical experiments demonstrated that the forecast accuracy can be improved (thus the limit of practical predictability can be extended) through the using of probabilistic approach based on ensemble forecasts. It is shown that the quality of forecasts of the regimes of circulation like blocking is higher, than that of zonal flow.