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Anomalies of Siberian High Intensity and Their Precursors in Climatic Models Output

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The Siberian High (SH) is a powerful pressure system that determines the weather regime during the wintertime for the huge part of Asia [Sazonov B.I., 1991]. Particularly, SH regulates an intensity and duration of frosts in Siberia. Moreover, this pressure system has a strong connection with another atmospheric centers of action of the Northern Hemisphere such as Arctic High, Icelandic Low, the Azores High [Morozova S.V., 2013]. SH variation is closely related to atmospheric dynamics processes and air temperature variations between surface and middle troposphere. The maintaining of SH mainly depends on downward through the troposphere airflow which variation is strongly affected by the Arctic oscillation (AO). Positive (negative) AO phase causes the remarkably weakening (strengthening) of the downward airflow that has strong effect on the SH behavior [Gong G. et al., 2002; Krupchatnikov V. N. et al., 2009; Martynova Yu.V. and V.N. Krupchatnikov, 2010].

SH is highly exposed to global climate change that increases standard deviation of SH intensity [Fei L.I. and G. A. O. Yong-Qi, 2015]. The changes of SH characteristics result from not only direct climate change effect (such as global temperature rise) but also feedback effect of another climate system parameters variation. Thus, these parameters can serve as precursors of the extremely SH intensity. It's important to remember that the changes of the just one component of this High-Low interaction system could affect whole system.

This study is devoted to determination of the precursors of the anomaly SH behavior and estimation of changes of the determined connection in the climate change conditions. The research was provided on a base of climate system models and reanalysis data.

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