

The modern and future large-scale atmospheric circulation over Southern Hemisphere and Antarctic.

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Abstract

Climate change does not happen suddenly and for a short time. In order to change the climate, first of all, atmospheric large-scale circulation must be prepared for change. Without this transformation, basic meteorological parameters such as temperature and precipitation, which underlie climate change research, can not change. For the analysis of the climatic regime changes in the area of the South Polar Region is necessary to examine the transformation of the atmospheric circulation from decade to decade since the beginning of period of global warming in this region. The short archive of the observations over South Hemisphere of the sea level pressure and geopotential fields was supplemented by reconstruction this fields from ending 19th century till the second half of the 20th century for this region. Comparative assessment of reconstructed and actual pressure fields over the South Hemisphere was made for the last decades of the 20th century and received successful estimation. The created archives of pressure fields from the ending 19th century for the Northern and Southern hemispheres allowed to get regularities of atmospheric circulation . The period of oscillations of large-scale atmospheric circulation over NH and SH is about 50-60 years. This corresponds to a shift of the large-scale atmospheric circulation to the west-east to ± 20 degrees. The direction of the displacement of the circulation to the east (up to +20 degrees) leads to its weakening, in the west (to 20 degrees) leads to its intensity. Since the beginning of the 21th century the large-scale atmospheric circulation is moving to the west. So, to the middle of the current century, we should expect intensification the large-scale atmospheric circulation.

Keywords: climate, temperature changes, atmospheric circulation

References

- Martazinova V., Tymofeyev V.E. Interdecadal changes of tropospheric circulation in Southern extratropics during the recent warming in the Antarctic Peninsula // The 10th International Symposium on Antarctic Earth Science, 10thISAES, Santa Barbara, Geological Survey and The National Academies, USGS OF-2007-1047. Ext. Abs.067, 2007
- Martazinova, V. The change of the large-scale atmospheric circulation over the North Hemisphere during 1900-2010 // American Geophysical Union, Fall Meeting 2014, abstract #A32C-06
- Martazinova, V. The transformation of the large-scale atmospheric circulation during the 20th and beginning of the 21th centuries.// APCC Seminar Reports, 2006.
- Martazinova, V., Tymofeyev V.E., Ivanova E.K. Tropospheric circulation in Austral extratropics during the recent warming episode in the Antarctic peninsula.// Abs. SCAR/IASC Open Science conf. ,St . Petersburg, Russia, 2008.
- Martazinova, V., Tymofeyev V.E., Ivanova E.K. Large-scale atmospheric circulation in southern extratropics and regional weather patterns at Antarctic peninsula.// Kiyiv, Ukraine, 2010