

PECULIARITIES OF DYNAMICS OF THE GLOBAL ELECTRIC CIRCUIT ELEMENTS DURING VERY LOW SOLAR ACTIVITY

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Accumulated data about dynamics of various elements of the solar - terrestrial relationship allow us to approach the problem of the solar activity influence on the middle atmosphere with taking into account role of the ground surface electrical conductivity. A special importance of this problem appears in the 23 cycle of the solar activity (2006-2009 years). This period is characterized by unusually low values of solar UV radiation as well as of magnitudes of the solar wind magnetic field. It means that impact of the solar electromagnetic energy on the near – Earth space is much weaker than usually. The Earth global electric circuit which includes the ionosphere, the stratosphere and the ground surface as its vital components has its own specific features during considered period. In this paper we outline these peculiarities of the global electric circuit and its influence on the middle atmosphere. First of all, we will demonstrate that experimental values of the atmospheric electric field (observations at Vostok Station, Antarctica) are the lowest during the last 3 years. We claim that role of the electric conductivity of the ground surface begin to play more significant role in the dynamics of the global electric circuit. To confirm that suggestion we studied interaction between the stratospheric temperature distribution in the high latitudes in winters of 2008 – 2009 and the area of the old sea ice (pack ice) in the Arctic Ocean during the same period. We will show that the areas of the low temperatures in the polar stratosphere correspond pretty well to distribution of the pack ice in the Arctic. Our explanation of the phenomena is based on difference of electric conductivity of the ice and of the open ocean water.

Solar activity, global terrestrial electric circuit, stratosphere

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