

Research of the solar activity influence on the Earth troposphere

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Basic points of the model of solar activity influence on the climate system of the Earth are represented here. The key concept of the model – is the influence of heliogeophysical disturbances on the parameters of Earth climate system regulating the energy flux radiated from the Earth into the space at high-latitude regions. The model is based on the physical mechanism of heliogeophysical factors influence on the climate characteristics and atmosphere circulation in the high-latitude troposphere through the atmosphere electricity. According to this mechanism, on the one hand, the atmosphere electricity parameters at high latitudes are under the significant influence of solar activity; on the other hand, it greatly influences the distribution according to the height in troposphere of charged condensation cores and, consequently, the formation of cloudiness and radiation balance. It is shown and proved that this mechanism effectively works in high-latitude regions, leading to the additional formation of cloudiness in the regions where there is a needed concentration of the water vapor.

The estimates of temperature, pressure and radiation balance changes was carried out in high-latitude regions where the changes of the water vapor phase condition happen because of the influence of heliogeophysical factors. It is shown that the largest and unambiguous influence of solar activity on the climate system condition is observed during the periods when there is absence of the ingoing radiation flux of the energy (high-latitude regions during the cold period), because in this case any cloudiness leads to the decrease of energy losses by the climate system.

The model predicts that the temperature will increase more during the cold period and during the night time. As a result, by the increase of solar activity level the daily and annual run of temperature will rise. Thus, by the solar activity increase, as a result of the work of mentioned above mechanism, there happens the decrease of energy losses by the climate system of the Earth, generally, in high-latitude regions.

Here are represented the results of the complex analysis of temperature and pressure fields reaction in troposphere of high latitudes to various heliogeophysical disturbances.