

# **LONG - TERM TRENDS IN TEMPERATURE OF THE ARCTIC ATMOSPHERE AND THEIR RELATION TO VARIATIONS OF SOLAR ACTIVITY**

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Traditionally all conclusions concerning the global changes of the Earth's climate were based on analysis of the long – term trends in dynamics of the main atmospheric parameters: temperature and humidity. The solar activity as a possible candidate capable to influence on the long – term variations of the atmospheric temperature is considered in this study. A level of the solar activity was evaluated not by the traditional non-dimensional index – sunspot number (SSN) but by a new, more reliable index – the total solar irradiance (TSI), expressed in the direct energy units ( $Wm^{-2}$ ). The solar wind as another parameter of the solar activity connected with amount of the solar electromagnetic energy emitted by the solar corona was also used in the study. The data of atmospheric balloon sounding at four polar and subpolar stations were chosen for study of long – term variations of atmospheric temperature as functions of the solar activity. These data are a part of a unique archive of the atmospheric balloon measurements made in the whole Arctic region during period of 1950-2000 years. Experimentally observed long – term trends in variations of the tropospheric and stratospheric temperatures could be related to some extent to variability of the solar activity. Impact of the solar wind energy on thermal regime of the stratosphere and troposphere in the Arctic could be different due to non-uniformity of electric conductivity of the ground surface as well as to different relations between conductivity of the atmospheric layers and ground surface. Increase of the annual values of the Earth's troposphere temperature observed during the last decades could be attributed partially to correspondent enhancement of the solar activity in the same period.