

Influence of solar wind on the temperatures of the troposphere and lower stratosphere

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The correlation between surface temperature and solar magnetic activity is evident though the cause is not clear. In this presentation, we analyze the vertical structure of the global atmosphere to examine the cause on the basis of the previous observations [1].

The OMINI2 solar wind data as well as the aa index data were used to detect the influence of the solar wind on the vertical temperature distribution. The period examined was 1980-2010, and the region examined was Sodankyla, Finland. The aerological data was obtained from Wyoming University HP.

In the analysis, the following factors were taken into account: 1) near UV is mainly absorbed by the atmosphere in the vicinity of 50 km altitude, and hence, the temperature there changes 1-2 degC during the 11 year solar cycle: 2) in the ionosphere, the height of the D layer will change with solar flares.

We analyzed the phases of the OMINI2 solar wind data and the aerological data to examine whether and how the effect of the solar wind propagates from the D layer to the lower stratosphere and troposphere. Meteorological rocket data will also be effective for the analysis in future.

References

K. Itoh, JpGU 2008-2011.

Keywords: solar wind, troposphere, lower stratosphere, geomagnetic activity index, temperature, correlation