



Influence of the large-scale weather structures onto the temperature of upper Earth's atmosphere from the satellite TIMED measurements

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Upper Earth's atmosphere is a complex dynamical and photochemical system, which is sensitive to the effect from both above and below. The influences from above are caused mainly by solar and geomagnetic activity. The effects from below are often connected lately with gravity waves, which can be produced by powerful natural or artificial phenomena on the Earth's surface and in the atmosphere. We investigated in this work the possible influence of large-scale weather structures onto temperature of upper atmosphere of the Earth. In spite of the fact that the cyclones arise in lower atmosphere layers and reach an altitude of a few tens of kilometers they transport a huge energy, which can have an influence onto upper atmosphere parameters. Values of temperature of upper Earth's atmosphere in the height range 70-150 km over cyclones (anti-cyclones) were examined. We used for consideration the temperature profiles obtained by the device TIDI (TIMED Doppler Interferometer) installed on the satellite TIMED (Thermosphere Ionosphere Mesosphere Energetics and Dynamics). We investigated 7 cyclones (anti-cyclones) of 5-th power category on the scale of Saffire-Simpson, which happen in 2004-2005. For 6 events among considered we have registered the temperature increase in altitudinal range 70-115 km inside zone of 500 km from epicenter. The temperature increase is about 10-15 K. The variations of solar and geomagnetic activity do not explain the obtained temperature changes.