



Investigation of dependence of the 557.7 nm upper atmospheric airglow from the atmospheric temperature at different height levels

I.V. Medvedeva, M.A. Chernigovskaya, and A.V. Mikhalev

Institute of Solar-Terrestrial Physics SB RAS, Irkutsk, Russian Federation (ivmed@iszf.irk.ru, +7 (3952) 425557)

This work presents the analysis of the temporal variations of the 557.7 nm atmospheric emission intensity and variations of altitude distribution of the atmosphere temperature. The experimental data of the atomic oxygen 557.7 nm airglow (emitting layer height is 85-115 km) obtained at ISTP Geophysical observatory near Irkutsk (52°N, 103°E) were used. Also we included in the analysis the satellite data of vertical temperature distribution in a stratosphere-mesosphere by MLS (Microwave Limb Sounder) aboard the spacecraft EOS Aura. We have analyzed the 557.7 nm airglow intensity averaged per night together with night altitude profiles of the atmosphere temperature.

The regression coupling of the atmospheric 557.7 nm emission intensity with the temperature of the atmosphere at heights of the mesosphere (0.001 hPa) and the stratosphere (10 hPa) was revealed. Possible mechanisms of the influence of the atmosphere temperature on the 557.7 nm airglow intensities, including planetary waves activity, are discussed.

Also we made an attempt to reveal the regression coupling of the atmospheric 557.7 nm emission disturbances with the temperature of the atmosphere at heights of mesosphere-low thermosphere: 0.01 hPa (about 80 km), 0.0046 hPa (about 84 km), 0.0022 hPa (about 88 km), 0.001 hPa (about 92 km) and 0.00046 hPa (about 96 km) for the stratospheric temperature disturbances at 10 hPa level (about 30 km) events in winter periods.

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