SPECTUM OF THE NEAR INFRARED AIRGLOW AT THE MIDDLE LATITUDE

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Investigations of the upper atmosphere characteristics by observations of the airglow are made at Zvenigorod (55.7 deg. N, 36.8 deg. E) since 1955. Nowadays in the observations of the airglow spectrum in night time the spectrographs, equipped with a CCD camera, are used. The absolute calibration of the instruments were conducted by the comparison with the radiation spectrum of the Capella star. For example, the nightglow spectra in the region 620-1050 nm with a resolution of 0.4 nm are presented for both the quite geomagnetic conditions (Ap=4, January 25, 2001) and the geomagnetic storm (Ap=155, March 31, 2001) at the middle latitude. In the first case, the night spectrum of the upper atmosphere is due to the emissions of hydroxyl (sequences of rotation-vibration bands with delta v being equal to 3-5), molecular oxygen (Atmospheric band (0-1) at 864.5 nm), atomic oxygen (630 nm and 636.4 nm) and the NO2 continuum. Some of the hydroxyl bands are blended by absorption lines of the tropospheric water vapour. In the second case, some additional spectral features are the bright lines of OI at 777.4 nm (unresolved multiplet) and at 844.6 nm (unresolved triplet), of Meinel system bands of ionized N2 (2-0) at 788 nm, (1-0) at 921 nm and (2-1) at 950 nm and of ionized O at 732 nm. The absolute intensity of all spectral features were determined. The obtained spectral distribution of the atmospheric radiation intensity can be the referred spectral atlas of the nightglow and auroras.