



Coupling between the night variations in the red 630.0 nm line nightglow intensity and long-term changes in the meridional wind velocity

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The long-term variations in the red 630.0 nm line intensity for different seasons are investigated using Abastumani (41.75 N; 42.82 E) data, obtained in 1957-1993. The Oxygen red 630.0 nm line total nightglow intensity seasonal and night long-term variations are compared with the long-term variations in the ionosphere F2 layer peak height (hmF2) at Tbilisi (41.65 N, 44.75 E) ionosonde station (1963-1986). The long-term increase in the red line intensity, observed after astronomical twilight for most seasons and its decrease during midnight is considered as a result of the lowering of the ionosphere hmF2 peak height. The different values of the red line intensity long-term change (positive trend after twilight and negative at midnight) in different seasons may result from the southward wind velocity long-term decrease (or northward wind velocity increase).

An estimation of the lowering of the ionosphere peak height and corresponding red line intensity nighttime behaviour is done by using a Chapman type (damping in time) layer for the ionosphere F2 region electron density height distribution, which is solution of ambipolar diffusion equation and takes into account a meridional wind velocity.