Airglow of the oxygen emission 630 nm variations in the initial phase of mid-latitude auroras during the strong geomagnetic storms

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In the report the initial phases of mid-latitude auroras during the strong geomagnetic storms are analyzed. It is revealed, that the initial phase of mid-latitude auroras in emission of 630 nm during the extreme geomagnetic storms in March 24, 1991, April 6, 2000, October 30 and November 20, 2003 are characterized by the short ($\sim$1 hour) waveform disturbance. These disturbances correspond to the beginning of the main phase magnetic storms. The marked effect of mid-latitude auroras is analyzed, using data about the states of magnetosphere and ionosphere in these periods. The features of emission 630 nm intensity dynamics and its connection with dynamics of magnitospheric-ionospheric structures are considered. The possible excitation mechanisms of the emission of atomic oxygen in a line 630 nm during these disturbances are discussed.