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The influence of lightnings on VLF/LF signals observed by radiophysical earthquake prediction stations

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Based on the theory of cosmic-ray shower-runaway breakdown in thunderclouds developed by Gurevich et al. (Gurevich, Milikh, Roussel-Dupre, Phys. Lett. A 165, 463, 1992) changes of the degree of ionization and of the temperature in thunderstorm regions are discussed. Estimates of the variations of electrical conductivity and electric fields during the electron avalanche are performed.

Besides with ionization and heating, lightnings are connected with the generation of large amounts of intense radio pulses of different frequencies, the energy of which may be transported over large distances. Here waves in the VLF region are studied, which considerably disturb the reception of VLF radiophysical stations destinated to investigate subionospheric earthquake precursors. Especially tweeks (waves with frequencies below 30 kHz) and whistlers (2-40 kHz) are considered. Examples of the influence of thunderstorms on data observed by earthquake prediction stations are given.