

The features of variations of atmospheric electric field at Antarctic Vostok station

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Observations of the atmospheric, near-surface vertical electric field component E_z have been carried out at Antarctic station Vostok since 1998. The data for 1999-2001 are compared with local meteorological parameters, Solar wind magnetic field and global thunderstorm activity.

High and dry regions with no thunderstorms, such as the Antarctic plateau, are ideal sites for monitoring the global geoelectric circuit. Additional solar influences on the geoelectric field occur at high latitudes, via the same processes that generate the aurora. In conjunction with Australian and American colleagues, we measure the geoelectric field at the Russian station, Vostok, on the Antarctic plateau. We have shown that solar variability can influence the geoelectric field measured at ground level in Polar Regions.

It is shown that the local meteorological parameters such as temperature and wind velocity sufficiently influenced on the value of the electric field even during the periods satisfying the "fair weather" conditions. Reasons of these dependences are discussed.

Behavior of E_z field at Vostok station is compared with a number of intense lightning flashes determined on the base of the ground measurements of ELF magnetic field. We find pronounced negative correlation between hourly averaged E_z and the number of intense lightning flashes. Reasons for these dependences are discussed.