

The influence disturbances in the ionosphere caused by electron precipitation on the propagation of VLF signals

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The results of ground-based observations of VLF signals from the RSDN-20 radio navigation system, received at the Polar Geophysical Institute network, are presented in this work. It is shown that geomagnetic disturbances with AL index values of -500 nT and below in the nighttime can result in a decrease in signals of the Krasnodar VLF transmitter observed in the Lovozero observatory. The POES satellites, positioned at the geomagnetic field lines with foot-points near Lovozero, recorded high-energy electron fluxes exceeding 278 keV. The POES data also indicated that the precipitation area was about 200 km. We used the model of VLF propagation in the Earth's ionosphere irregular waveguide to demonstrate the connection between observed decrease in amplitude of VLF signals and electron precipitations.

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