

SPACE WEATHER RESEARCH IN YAKUTIA

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For many years, the Yu.G. Shafer Institute of Cosmophysical Research and Aeronomy SB RAS has been conducting experimental and theoretical studies of space weather manifestations. The Institute's geophysical stations are located primarily at high latitudes in the territory of Yakutia (northeastern part of Russia) and are capable of monitoring space weather over a large area of space in both latitude and longitude. Manifestations of space weather are studied in variations of cosmic rays, ionospheric parameters, geomagnetic field, auroras, and VLF emission. The report presents the results of studies of the following manifestations of space weather.

- Comparative analysis of the meridional and azimuthal propagation of Pc5 pulsations and their current systems based on ground-based and satellite observations;
- Study of the magnitude of sudden phase anomalies on VLF radio paths during solar flares;
- Study of SAR arc dynamics by ground-based and satellite observations;
- Study of ionospheric disturbances based on numerical modeling of large-scale structure of the ionosphere;
- Explanation of Forbush decreases in cosmic rays based on a physical model developed by the Institute's staff;
- Forecast of geoeffective disturbances based on analysis of the spectra of the interplanetary magnetic field and fluxes of energetic particles on a satellite located at the libration (L1) point. This method makes it possible to predict magnetospheric disturbances several hours in advance with a probability of up to 80%.