



Ionospheric irregularities dynamics during strong geomagnetic storm by incoherent scatter radar and GPS data

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During strong geomagnetic storm on November 8-12, 2004 was registered abnormally quasicoherent signals caused by ionospheric irregularities in areas with high electron density gradients. At night time 9.11.2004 and day time 10.11.2004 anomaly signals - coherent backscatter were observed. This signal by the correlation, spectral and temporary characteristics are different both from incoherent scatter signal, and from signals reflected from space vehicles. The maximum intensity of the signal was in the range 800-1000 km. The radial component of the process velocity calculated the correlation method was 300-500 m/s. The diffuse scattering spatial structure can be explained by radio waves scattering on intense small-scale irregularities generated near the southern boundary of the auroral oval during a strong geomagnetic storm.

Variations of the ionosphere spatial configuration during magnetic storms were also observed at the analysis of global maps of total electron content. There was observed a increasing of the total electron content at times close to the time of registration of the backscatter signal by ISR. During storms the intensity of irregularities essentially increases and the auroral oval expands to the equator. The maximal activity of TEC fluctuations took place when observed during a sharp decreasing of Dst index from approximately -140 up to -250 nTl. The analysis of TEC fluctuations derived using GPS shown that this technique can permanently provide effective information on the oval irregularities of the storm-time ionosphere.