

Observations of the ionospheric wave disturbances using the Kharkov incoherent scatter radar upon RF heating of the near-earth plasma

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Abstract

© 2015 Springer Science+Business Media New York. Characteristics of the wave disturbances of the ionospheric electron number density were measured using the Kharkov incoherent scatter radar. The disturbance generation accompanied the SURA heating of the near-Earth plasma by high-power periodic radiation. The distance between the heater and the radar was about 960 km. The possibility of generating ionospheric wave disturbances with a period of 20 to 30 min in the internal gravity wave range was confirmed. The disturbance propagation velocity was near 320–400 m/s, and the relative amplitude of the electron density variation was 1–10%. The wave disturbances appeared in the altitude range 145–235 km. Aperiodic bursts of the electron number density with a relative amplitude of up to 5–10% were detected after the first switch-ons of periodic radiation in the 30-min heating — 30-min pause regime at altitudes of 145 to 310 km. The observation results generally conform to the synchronous observation data obtained using the Kharkov vertical-sounding Doppler radar and a network of ionosondes.

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