

SOME PECULIARITIES OF ARTIFICIAL MAGNETIC PULSATION GENERATION DURING FINNISH EISCAT-HEATING EXPERIMENT IN NOVEMBER 1993

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Generation of Artificial ULF/VLF signals and Periodic Inhomogeneities (API) by HEATING and at the same time monitoring E- and F-region plasma parameters by EISCAT were the objectives of this experiment. Here we concentrate alone on the ULF signal response to HEATING. The ULF experiment implied sinusoidal modulation of the heating power with frequencies sweeping from 0.1 to 2.9 Hz in 50 mHz steps.

In all experiment runs of this type (in total some 20 hours during different local times and levels of magnetic activity) there was never a response at the remote site (some 30 km away from the heater) in the frequency range 0.1 to 0.8 Hz. If there was a response, it was usually above 1 Hz. On November 15, during a four hours lasting run, the ULF response at the remote site was only observed at the very last half a hour, during magnetic and even auroral activity at/over the heater site. EISCAT detected at the same time large variations in the E-region electron density. The intensity in the artificial ULF signal followed only badly the electron density variations seen by EISCAT.

We use a numerical model for the magnetic variations seen on the ground in order to pinpoint the ionospheric parameters which were most important for the generation of our heating induced ULF signals. It appears that we cannot give a fully account of the behavior of the ULF response to heating in our experiment on the basis of our model. Extension of our model including ionospheric wave guide properties are invisualized.