



ISR observations of HF-radio induced, recurring topside enhancements of the ionline at high latitudes

Theresa Rexer (1), Björn Gustavsson (1), Thomas Leyser (2), Mike Rietveld (3), and Tom Grydeland (4)

(1) UiT Arctic University of Norway, Institute for Physics and Technology, Tromsø, Norway, (2) Swedish Institute of Space Physics, Uppsala, Sweden, (3) European Incoherent Scatter Facility (EISCAT) Scientific Association, Ramfjordbotn, Norway, (4) Norut, Northern Research Institute, Tromsø, Norway

Simultaneous to the previously well-documented enhancements on the bottom side of the F-layer at the HF reflection height, a less intense, but clear, ion-line enhancement was observed at the topside ionosphere, recurring for 34 pulses during a high power, high frequency (HF), radio transmission experiment.

Observations were made with the European Incoherent SCATer (EISCAT) UHF radar in Tromsø, Norway.

The HF-pump wave was transmitted in a 3 minute ON 3 minute OFF cycle, stepping frequencies around the double resonance of the 3rd and 4th multiples of the gyro-frequency and the local plasma frequency in the F-region ionosphere.

The topside enhancements occurred when the transmitted frequency was near the double resonance of a gyro frequency multiple and the plasma frequency, and disappeared abruptly when the bottom side enhancement disappeared as the HF frequency was increased.

The observations are presented and discussed in terms of a possible L-mode propagation through the F-region peak.