



Topside enhancements of the ionline in response to high-power HF-radio wave pumping at high latitudes

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A high power, high frequency heating experiment of the polar ionosphere was conducted in Tromsø, Norway in March 2016. The wave-plasma interactions were observed with the European Incoherent SCATer UHF radar co-located with the heating facility.

HF pulses in a 3 minute ON 3 minute OFF cycles were transmitted, sweeping frequencies in 10 and 20 kHz steps from just below to just above the 3rd and 4th multiples of the F-region gyro-frequency.

Several interesting features have been found in the radar measurements of the backscatter from the heated plasma. In agreement with current theory we observed an enhanced ionline near the HF reflection height on the bottom-side of the F layer. Simultaneously, a less intense, but clearly visible, ionline enhancement was observed approximately 100 km above this bottom-side enhancement for several 3 minute sweep pulses.

We present the observations and discuss the top-side enhanced ion-line in relation to Z and L-mode propagation through the F-region peak.