

Traveling Ion Cyclotron Harmonic Waves Observed In The Dayside Polar Region: SS-520-2 Rocket Experiment

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ABSTRACT

We carried out the SS-520-2 rocket experiment on Ny-alesund, Svalbard, Norway and succeeded in observing the wave form data in the frequency range between 10Hz-15kHz and high frequency spectra data up to 3MHz by the onboard Plasma Wave Analyzer(PWA). The data show the impulsive packet-like waveforms with the frequency around 3kHz as well as the detailed structure of the auroral hiss emissions. The packet-like waveforms appear in the short duration of time and their frequency spectral peaks are below the lower cut off frequency. Their frequencies are in the range between plasma frequencies and in cyclotron frequencies. and their polarization is almost linear, which was identified by the two sets of original wire antennas lie on the plane perpendicular to the ambient magnetic field. The most plausible wave mode is the ion cyclotron harmonic waves propagating in the perpendicular direction relative to the ambient magnetic field. PWA has the capability to identify the wave propagation direction and corresponding phase velocity board on the interferometry system in one-axis waveform receiver. From the time correlation in the interferometry system, we roughly estimate that the phase velocity of the packet-like wave is about equal to 32km/s. We also conduct the linear dispersion analyses using the realistic parameters and show electron beam can excite the proton ion-bernstain modes are generated near the observed spectral peaks.

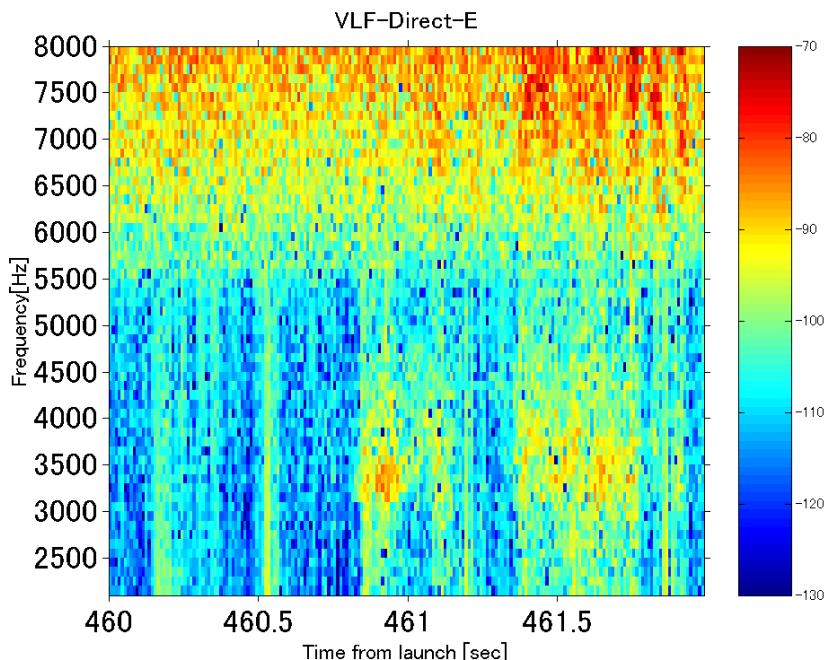


Fig 1 Electric field spectra observed by PWA