

Ground-based VLF wave observations at subauroral latitudes - VLF-CHAIN Campaign

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We report observations of very low frequency (VLF) waves during the VLF Campaign observation with High-resolution Aurora Imaging Network (VLF-Chain) of February 17-25, 2012, at subauroral latitudes at Athabasca (54.72N,246.69E, MLAT=61.3). Continuous measurements of VLF waves with a sampling rate of 100 kHz have been made since then to monitor daily variations of chorus waves and their detailed structures. We found quasi-periodic (Q-P) emissions for which their repetition period rapidly changes within one hour without corresponding magnetic pulsations and for which their intensity suddenly increased associated with a storm sudden commencement without changing their frequency. Patchy burst in the upper-band frequency ranges are often observed during magnetically disturbed times. Falling tone chorus whose rate of frequency change varies on a timescale less than a minute was observed. Clear systematic correlation of these various chorus waves with cosmic noise absorption was not seen throughout the campaign period. These observations indicate existence of several new types of VLF wave phenomena at subauroral latitudes.

Keywords: VLF wave, subauroral latitudes, ground-based observation