

A longitudinal network of VLF/ELF antennas and induction magnetometers at subauroral latitudes - Contribution to VarSITI

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We report observations of VLF/ELF chorus waves (~kHz) using loop antennas and Pc1 waves (~Hz) using induction magnetometers at longitudinally-distributed stations at subauroral latitudes. Continuous measurements of VLF waves with a sampling rate of 100 kHz have been made since September 2012 to monitor daily variations of chorus waves and their detailed structures at Athabasca (54.72N, 246.69E, MLAT=61.3). We observe various chorus emissions, such as quasi-periodic (Q-P) emissions, patchy burst emissions, rising and falling tone emissions at Athabasca. New loop antennas will be installed at Fredericton in the east-coast of Canada and at Zhigansk in the east-Siberia in Russia in 2014-2015. The induction magnetometer chain observes Pc1 geomagnetic pulsation which corresponds to electromagnetic ion cyclotron (EMIC) waves in the inner magnetosphere. The magnetometers have deployed in Athabasca, Magadan and Paratunka in far-eastern Russia, Moshiri and Sata in Japan, and will be deployed at Fredericton in the east-coast of Canada in 2014. These chorus waves and EMIC waves are known to contribute to the acceleration and loss of radiation belt particles. The longitudinal network of these measurements will provide continuous monitor of global distribution of the occurrence of these waves. These observations will contribute the next SCOSTEP program VarSITI, particularly to the SPeCIMEN Project.

Keywords: chorus wave, EMIC wave, Pc1 geomagnetic pulsations, ground-based multi-point observation, subauroral latitudes