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A multiple instrument investigation of the nature of geomagnetic pulsations

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Abstract content
 (Max 300 words)

Geomagnetic ultra low frequency (ULF) oscillations (frequency range 1mHz to 1Hz) have been observed for many years in magnetometer data and are endemic within the magnetosphere. A subset, pulsations in the Pc5 band (1-5mHz) are global magnetohydrodynamic (MHD) events in the magnetosphere. We use IDL pulsation finder program written by Magnus, L (An analysis of Pc5 pulsations observed in the SuperDARN radar data) to identify suitable Pc5 pulsations events for study in the radar and magnetometer data. Those events which also have a good data from magnetometer chains in the field of view of HF radars are chosen for analysis. These two instruments complement each other, HF radar are strong in sensitivity and temporal resolution while the magnetometers are strong in spatial resolution. We combined these two instruments to investigate the exact nature of the pulsations. Are they toroidal or poloidal? We present complex demodulation to determine amplitude and phase relationship between field components observed by the radar and magnetometer chains. Further, by determining their polarization and investigating amplitude and phase information, other characteristics can be determined, e.g. wave number. We present results in a graphical form and discuss them in the context of MHD theory of magnetic pulsations.

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Main supervisor (name and email)
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