

HIGH LATITUDE MAGNETOSPHERIC TOPOLOGY AND PC5 ULF WAVES

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This paper describes the use of small-scale magnetometer arrays at high Antarctic latitudes to study the effects of magnetosphere-solar wind coupling of geomagnetic field topology. Of particular interest are the resonance and propagation characteristics of Pc5 ultra-low frequency (ULF) waves in the vicinity of the cusp.

The Davis and Zhongshan Antarctic stations are located at ~-75 degrees (CGM) and 110km apart East-West, and near the last closed field lines in the magnetosphere and the noon-time cusp, while Mawson (-70 degrees CGM), an auroral station, is located deeper in the magnetosphere. The addition of two portable magnetometers located about 120 km poleward of Davis and Zhong Shan provides a square array for small scale studies.

We will show results from statistical and event studies using state vector spectral analyses involving crosspower, crossphase and ellipticity data from the close and wide spaced stations. On ~95 % of days in 1996 we can identify the presence of field line resonances driven by a Kelvin-Helmholtz instability-like source acting at the flanks of the magnetosphere. We will also outline a spectral analysis technique for separating the resonance and propagation signatures. These results have important implications for identifying the open/closed field line boundary.