

ULF Wave Activity over the Terrestrial Polar Caps as Observed by Cluster

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Ultra-low-frequency (ULF) wave activity over the northern and southern terrestrial polar caps is analyzed using Cluster Electron Drift Instrument (EDI), Flux Gate Magnetometer (FGM) and Cluster Ion Spectrometry (CIS) data. Wave activity is characterized by spectral character (broadband versus quasi-monochromatic), spectral power, wave polarization, standing ratio and the Fourier E/B ratio (as compared to the local Alfvén speed). In addition, the multi-spacecraft aspect of Cluster allows for inter-spacecraft energy distribution and inter-spacecraft coherence analysis. Event studies highlight distinct features and suggest an organization of the data in terms of latitude and magnetic local time. Preliminary statistics will be presented in an attempt to delineate the various sources of wave activity in terms of proximity to poleward dayside cusp and nightside auroral boundary features (e.g. velocity shears and density gradients, as discussed by *D'Angelo* [1973]) and higher latitude magnetotail processes (e.g. the magnetotail as a waveguide, converting fast mode energy from the distant tail into Alfvén mode energy preferably on lobe field lines, as discussed by *Allan and Wright* [1998]).

N. D'Angelo, Ultralow Frequency Fluctuations at the Polar Cusp Boundaries, *J. Geophys. Res.*, 78, 1208, 1973.

Allan, W., and A. N. Wright, Hydromagnetic wave propagation and coupling in a magnetotail waveguide, *J. Geophys. Res.*, 103, 2359, 1998.