

Clark's abstract
Title:

ULF Pc 3-4 Pulsations: Observations, Processing, and Characterization in the California Region

Pulsations are known to occur in the 0.005 - 0.1 Hz (period = 10 sec-150 sec) portion of the geomagnetic spectrum as a strong signal. They have been designated as Pc 3 & 4, and prior work has sought to determine the structure of the magnetospheric standing waves for use in estimating density of the plasmasphere, etc. (Russell, et al. [1998]). Pc 3-4 characteristics also have held long interest for seismologists, as they are a form of contamination when using digital seismometers to attempt measurements of long-period motion.

Another recent source of interest in these pulsations stems from the announcement that some researchers have seen fluctuations in the geomagnetic signal associated with earthquakes. Reports of these anomalies have spanned frequencies in the range of 0.01 Hz, thus long term monitoring of Pc3-4 activity over California may be critical in defining the normal, background signal levels when looking for potential earthquake-related ULF signals.

The deployment of high-resolution search coils in Quakefinder's CalMagNet in 2005, have allowed a much higher resolution and wider geographic distribution of measurements to study these complex signals.

The analytical techniques of multi-channel coherence, wave analysis, and signal space separation provide unique characterizations of these signals, including latitude dependency. Progress in studying the geomagnetic signal using these techniques is presented, the signal estimator's design is shown, and future directions are discussed.