



ELF emissions observed below 100 Hz at Lulin Observatory

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The ELF magnetic field antenna was mounted at Lulin Observatory (23.47°N, 120.87°E, 2862m) in the Yu-Shan National Park of Taiwan and was operated since August, 2003. Variety of ELF emissions below 100 Hz was detected since then and the preliminary analysis was reported at the 2005 AGU Fall Meeting. They were categorized according to event patterns on $f - t$ spectrograms based on the classification method used by *Helliwell* [1965] for observed VLF emissions. Discrete emissions, quasi-periodic emissions, and triggered emissions were found in these ELF emissions. Yet, there are still many events not able to be categorized from the above method. In this poster we will include other classification methods such as those for ELF-VLF emissions [*Sato and Fukunishi*, 1981] and/or for ULF emissions to group these unclassified ELF emissions. The polarizations of these observed events will be also studied. Since wave emissions at this frequency ranges have not been well investigated so far, we hope the analysis here will initiate studies on their source mechanisms and associated plasma properties of the environmental ionosphere and plasmasphere.

Helliwell, R.A., Whistlers and related ionospheric phenomena, Stanford Univ. Press, California, 1965.

Sato, N., and H. Fukunishi, Interaction between ELF-VLF emissions and magnetic pulsations: Classification of quasi-periodic emissions based on frequency-time spectra, *J. Geophys. Res.*, 86, 19, 1981.