

Newly Discovered ULF Periodicity of Daytime Auroral Pulsations

- Pc5-range (period of ~10-min) diffuse auroral pulsations appeared at South Pole, Antarctica, around local noon. The temporal signature was characterized as repetitive “On” and “Off” phases of diffuse auroral brightness.
- The 2-D auroral signature represented the periodic spatial variation of poleward-moving (~1.5 km/s), non-pulsating diffuse auroral patches, rather than the periodic luminosity variation of a pulsating diffuse auroral patch.
- The auroral pulsations were well correlated with Pc5 CNA (Riometer) and VLF pulsations, suggesting that the ULF modulation of chorus waves played a mediate role in the precipitation of tens-of-keV electrons into the auroral pulsation region.
- The THEMIS-D spacecraft, which was located in the afternoon outer magnetosphere, measured corresponding $|B|$ pulsations with the same period.

This study has provided direct evidence that compressional Pc5 ULF waves in the dayside outer magnetosphere determine the periodicity of daytime Pc5 diffuse auroral pulsations

