A statistical study of Pc 3-5 pulsations observed at ground coordinated stations

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We have statistically analyzed Pc 3-5 geomagnetic pulsations observed in 1994 at the 210 degree magnetic meridian (MM) network stations. Power spectral density, coherence, and phase difference for each station were computed by FFT (fast Fourier transform) method. The major results are summarized as follows.

1, At L=1.6-5.5, the D-component Pc 3, 5 pulsations at 0800-1300 LT show a out-of -phase relation with those at 1300-1700 LT.

2, Coherence between Pc 3, 5 pulsations at L=1.6 and those at L=1.01 shows a season-dependent northern/southern asymmetry.

Result 2 indicates that the ionosphere should play a very important role in the transmission of the magnetic pulsations from high latitude to low latitude.

We have statistically analyzed Pc 3-5 geomagnetic pulsations observed in 1994 at the 210 degree magnetic meridian (MM) network stations over a wide range of latitudes. Power spectral density, coherence, and phase difference for each station were computed by FFT (fast Fourier transform) method. GUA (Guam; L=1.01, MLat =5.6 deg., MLong=215.6 deg.) located near the magnetic equator was selected as a reference station for the coherence and phase difference. At this location, field line resonance does not occur because of the small vertical component of the ambient magnetic field. The major results are summarized as follows.

1, At L=1.6-5.5, the D-component Pc 3, 5 pulsations at 0800-1300 LT show a out-of -phase relation with those at 1300-1700 LT.

2, Coherence between Pc 3, 5 pulsations at L=1.6 and those at L=1.01 shows a season-dependent northern/southern asymmetry. That is, coherence in the summer hemisphere is higher than that in the winter hemisphere.

Assuming that the seasonal variation of the coherence is related to the variation of the electrical conductivity of the ionosphere, the result 2 indicates that the ionosphere should play a very important role in the transmission of the magnetic pulsations from high latitude to low latitude.