

Analysis of CPMN ULF data at the magnetic conjugate points

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In order to understand generation and propagation mechanisms of Pc3-5 magnetic pulsations, we analyzed magnetic 3(H, D, Z)-component data at the conjugate points of the Circum-pan Pacific Magnetometer Network (CPMN) stations. Especially, the coherence, the phase difference and the power ratio of Pc3-5 waves between the conjugate points at higher latitudes [KOT; (L=5.40, Bo=55,600nT), MCQ; (5.40, 64,700nT)] and lower latitudes [MSR; (1.59, 50,250nT), BSV; (1.55, 54,500nT)] are examined to investigate the ionospheric effect on Pc3-5 pulsations.

The following results were obtained;

(1) The power ratios of the H-component Pc3-5's between the conjugate stations show seasonal and non-seasonal variations. At the higher latitudes, Pc3 pulsations (T=10-45sec) show smaller powers in the summer hemisphere, while Pc4-5 pulsations (T=45-600sec) show larger powers in the northern hemisphere in all seasons. At the lower latitudes, Pc4-5 pulsations (T=45-600sec) show larger powers in the summer hemisphere, while Pc3 pulsations (T=10-45sec) show larger powers in the northern hemisphere in all seasons.

(2) The powers of the D-component Pc3-5's at the conjugate stations are larger in the northern hemisphere in all seasons.

(3) The powers of the Z-component Pc3-5's at the conjugate stations are larger in the southern hemisphere in all seasons.

At the higher-latitude conjugate stations, the seasonal variations of the H-component Pc3-4 powers can be explained by using the ionospheric shielding effect on the standing field line oscillations. The non-seasonal variations of the H-component Pc4-5 powers must be caused mainly by the asymmetry of ambient magnetic field intensities at KOT and MCQ. At the lower-latitude conjugate stations, the seasonal variations of the H-component Pc4-5 powers can be interpreted with the ionospheric currents driven by electric source fields at higher latitudes. The non-seasonal variations of the H-component Pc3 powers may indicate the penetration of compressional waves into the asymmetric magnetic fields at MSR and BSV. These results of the D- and Z-components are still under consideration. The Z-component variations may be caused by the effect of conductivity anomaly under the stations.