Pc3 ULF waves in the magnetosheath

Yuichi Shinkai[1], Tohru Sakurai[2], Yutaka Tonegawa[3], Toshifumi Mukai[4], Koichiro Tsuruda[4], Susumu Kokubun[5]

[1] Dept. of Aeronautics and Astronautics, School of Engineering, Tokai Univ., [2] Dept. of Aero- and Astronautics, School of Engineering, Tokai Univ., [3] Dep. Aero. & Astro., Tokai Univ., [4] ISAS, [5] STEL, Nagoya Univ.

In order to clarify a source wave of Pc 3 ULF waves observed in the magnetosphere and on the ground, we examined characteristics of Pc 3 ULF waves in the magnetosheath observed on 4 March 1995 by the GEOTAIL satellite.

In order to clarify a source wave of Pc 3 ULF waves observed in the magnetosphere and on the ground, we examined characteristics of Pc 3 ULF waves in the magnetosheath observed on 4 March 1995 by the GEOTAIL satellite. The results are summarized as follows;

1. Typical Pc 3 ULF waves were observed in the magnetosheath during 4 hours with the largest amplitudes occurring at the just down stream of the bow shock.
2. However, upstream waves corresponding to the Pc 3 in the magnetosheath could not be observed in the interplanetary space.
3. Typical amplitudes of the magnetic field and electric field oscillations were 5 to 10 nT and 1 to 2 mV/m, respectively.
4. Spectral power was observed at the frequencies of 0.04 Hz, and 0.08 Hz. The dominant power exhibited at the lower frequency of 0.04 Hz.
5. These waves appeared with different kinds of wave modes, containing Alfven, fast and slow magnetosonic modes.
6. The fast mode wave showed a nearly perpendicular propagation to the ambient magnetic field direction with 50 to 70 degrees.
7. The standing oscillation frequency between the bow shock and the dayside magnetopause with the fast mode wave speed about 1000 km/s was found to coincide nicely with the typical frequency of the Pc 3, 0.04 Hz.