

## A case study on the relation between ULF wave and temperature variation in the plasma sheet

# Miho Saito[1]; Yoshifumi Saito[2]; Toshifumi Mukai[3]

[1] Earth and Planetary Sci, Tokyo Univ; [2] ISAS; [3] ISAS/JAXA

Hot plasma in the plasma sheet is one of the great concerns of space plasma physics due to variety of heating process and instabilities that favorably grows in high-beta plasma. Using Geotail magnetic field and plasma data, ULF waves [mHz to 3Hz] in the plasma sheet are analyzed on the event study basis. Both transverse and compressional waves are observed in the Plasma sheet. While some of the waves are caused by the magnetotail flapping motion or reconfiguration due to the change of the solar wind parameters, others may be locally excited via micro and macro instabilities. Since it is expected from the theory and simulations reported by many authors that ions strongly interact with ULF waves, we will investigate the relation between their properties and the 3D ion distribution function. The time resolution of Geotail low energy particle data(12 seconds) may be enough for this investigation. Time series data obtained by a single spacecraft include both variations that are caused by time dependant phenomena and the motions of a spacecraft relative to spatial structures. The latter component is discernable in some cases. For example, steady temperature increase observed in approaching central plasma sheet is characterized by decreasing Bx and By and vice versa. By selecting events which presumably show only the time dependant temperature increase, we will investigate possible local heating processes in the plasma sheet.