Comparative studies on polar ionosphere and magnetotail dynamics based on simultaneous multi-point observations: (1)

Masafumi Hirahara[1]; Satoru Onodera[2]; Shin Toriumi[3]; Yukinaga Miyashita[4]; Taku Takada[5]; Kanako Seki[4]; Yusuke Ebihara[6]; Takeshi Sakanoi[7]; Kazushi Asamura[5]; Atsushi Yamazaki[5]

[1] Dept. Earth & Planet. Sci, Univ. Tokyo; [2] Earth & Planetary Sci., Univ. of Tokyo; [3] Earth and Planetary Science, Univ. of Tokyo; [4] STEL, Nagoya Univ.; [5] ISAS/JAXA; [6] Nagoua Univ., IAR; [7] Planet. Plasma Atmos. Res. Cent., Tohoku Univ.

On the basis of the comparative studies using simultaneous multipoint observations both in the polar ionosphere and the magnetotial of the Geospace, we could invesitigate the relationship and causality seen among the auroral forms, the auroral electron precipitations, and the plasma sheet dynamics like fast bulk plasma flow, dipolarization of the magnetic field, and plasma energization. The field-aligned current and the Alfven wave are important elements for connecting these plasma phenomena. Recently, it is noticeable that the ground-based observation networks are developed also by the Japanese research groups as well as the European/US groups and that the satellite missions with characteristic performance are carried out by the Japanese and European/US teams, for instance, Geotail, Reimei, CLUSTER II, DMSP, FAST, and THEMIS. In particular, Reimei has been providing us with very unique data obtained by high-time and -spatial resolutions in the polar ionosphere. The data from Geotail and THEMIS satellites/GBO are open and highly available on their web sites. In this presentation, we will report recent results by the comparative studies using the mutiple/simultaneous observations from the above. These manysided and comprehensive data analyses would bring the new perspectives and shed a light on the actual and logical interpretations on the magnetosphere-ionosphere coupling processes causing the a variety of auroral and plasma sheet phenomena. We will focus on the data obtained around 07:50 UT on Feb. 13, 2008 and 08:07 UT on Mar. 24, 2007, in which the upstream conditions of the solar wind, the plasma sheet processes, and the clear variations of the auroral emissions and the auroral particles in the polar ionosphere could be discussed.