

昼側磁気圏界面リコネクションの最地球側開放境界層におけるプラズマ波動

内野 宏俊 [1]; 栗田 怜 [2]; 原田 裕己 [3]; 町田 忍 [4]; Angelopoulos Vassilis[5]
[1] 京大・理・地惑; [2] 名大 ISEE; [3] 京大・理・地球惑星; [4] 名大・ISEE; [5] UCLA

Waves in the innermost open boundary layer formed by dayside magnetopause reconnection

Hirotochi Uchino[1]; Satoshi Kurita[2]; Yuki Harada[3]; Shinobu Machida[4]; Vassilis Angelopoulos[5]
[1] SPEL, Kyoto Univ.; [2] ISEE, Nagoya Univ.; [3] Dept. of Geophys., Kyoto Univ.; [4] ISEE, Nagoya Univ.; [5] UCLA

We present two THEMIS observations of whistler-mode and electrostatic wave events in the innermost open boundary layer (IOBL), formed by dayside magnetopause reconnection. The IOBL is identified by high-speed electron flow on the magnetospheric side of the ion outflow from the reconnection site. Quasi-parallel whistler-mode waves propagating toward the reconnection region are observed in association with a partial shortage of magnetospheric electrons moving away from the reconnection region at small pitch angles. We interpret the partial shortage of magnetospheric electrons as caused by a change in the magnetic field geometry due to reconnection, which suddenly opens the magnetosphere to the magnetosheath. Calculation of wave linear growth rates shows that the waves can be excited by the perpendicular electron temperature anisotropy that develops due to the partial shortage of field-aligned magnetospheric electrons. Electrostatic waves close to the lower hybrid resonance frequency are observed in the IOBL in the second case, during the main phase of a magnetospheric storm. Magnetospheric electrons are almost completely lost in the event, except at pitch angles close to 90 degrees, yet whistler-mode waves are not observed. An electron beam from the magnetosheath and cold ions originating from the plasmaspheric plume are observed in association with the electrostatic waves. Growth rate calculation shows that the waves can be excited via couplings between the electron beam and cold ions. We suggest that the duration of magnetopause reconnection is one factor controlling the properties of waves excited in the IOBL.