

Reduction in ENA emission coming from the direction of the subsolar magnetopause: Occurrence of the plasma depletion layer

Ryo Nishizawa[1]; Satoshi Taguchi[1]; Keisuke Hosokawa[1]; Michael R. Collier[2]; Thomas E. Moore[2]

[1] Univ. of Electro-Communications; [2] NASA GSFC

By analyzing IMAGE/LENA emission coming from the general direction of the subsolar magnetopause, and comparing the result with the model distribution of the neutral atom flux in the magnetosheath, which is estimated from the Spreiter and Stahara gasdynamic model, we have developed a method in which the subsolar magnetopause motion with a timescale of 2 min is obtained. The result from our method is generally consistent with simultaneous observations at geosynchronous orbits. However, there are several intervals in which no consistency can be seen. More specifically, although the magnetopause is inside the geosynchronous orbit, for which neutral atom emission is usually expected to be enhanced, the actual LENA emission is extremely reduced, and the subsolar distance is estimated to be distant from the geosynchronous orbit. For this kind of event, the magnetic field in the subsolar magnetosheath has a northward component, and stronger magnitude than expected. From these we suggest that a layer with lower plasma density and higher magnetic field, i.e., the plasma depletion layer occurs on the sunward side of the magnetopause. The solar wind condition for the appearance and disappearance of the plasma depletion layer is presented, and the result will be discussed in terms of the tilting of the northward IMF.