

Japan Geoscience Union Meeting 2011

(May 22-27 2011 at Makuhari, Chiba, Japan)

©2011. Japan Geoscience Union. All Rights Reserved.



PEM027-P03

Room:Convention Hall

Time:May 25 10:30-13:00

Contribution of kinetic Alfvén waves to the formation of the low-latitude boundary layer

Tomohiko Izutsu^{1*}, Takuma Nakamura², Hiroshi Hasegawa², Masaki Fujimoto²

¹The Univ. of Tokyo, ²ISAS/JAXA

One of the biggest problems in magnetospheric physics is to understand how the solar wind plasma enters the magnetosphere and forms the low-latitude boundary layer (LLBL) during northward interplanetary magnetic field periods. Several processes have been suggested including: (1) magnetic reconnection at the poleward-of-the-cusp in both hemispheres, (2) reconnection or turbulence within well-developed Kelvin Helmholtz vortices on the flank magnetopause, and (3) diffusive transport induced by wave-particle interactions.

Regarding the third process, we revealed from test particle simulations that transverse and compressional fluctuations via kinetic Alfvén waves (KAWs) can cause selective transport associated with their perpendicular wavelengths. Applying the results to a magnetopause crossing event in which the existence of the KAWs had been identified, we successfully found that KAWs can actually transport solar wind plasma across the magnetopause. In this presentation, we will show applications to various magnetopause-crossing events and discuss whether the KAWs can contribute to the formation of the LLBL.

Keywords: low latitude boundary layer, plasma wave, kinetic Alfvén wave, reconnection, plasma transport