By dominated magnetopause reconnection and its role in the formation of LLBL

X. G. Zhang (1), Z. Y. Pu (1), C. J. Xiao (2), M W. Dunlop (3), X .G. Wang (4), J. Wang (1), S. Y. Fu (1), M. C. Carr (5), C. Perry (3), H. Reme (6)čň A. Fazakerley (7), Z. X. Liu (8) and K.-H. Glassmeier (9)

(1) School of Earth and Space Sciences, Peking University, China (zhangxg@pku.edu.cn / Fax: 86 10-62753823), (2) National Astronomical Observatories, CAS, China, (3) Space Sciences Division, RAL, UK, (4) Center for Plasma Physics, DUST, Dalian, China, (5) The Blackett Laboratory, Imperial College, UK, (6) CESR, France, (7) MSSL, UK, (8) CSSAR, CAS, China, (9) IGEP, Technical University of Braunschweig, 38106 Braunschweig, Germany

Abstract

Previous Cluster observations provided evidence that when the dominated component of the IMF appears in the Y-direction; magnetopause reconnection occurs in the cusp or at high-latitudes, playing a significant role in dynamic processes in the cusp region. Coordinated measurements of Cluster and Double Star give the opportunity to investigate the global configuration and consequence of the By-dominated magnetopause reconnection. From Cluster and Double Star measurements made in the dayside during 2004 and 2005, we have found a few typical events in which B_y-dominated reconnection operates both in the cusp and dayside low-latitude magnetopause. In the cusp high-speed V_y-jet opposite to the background flow is seen which is closely related with relevant variation of B_y (and B_z). In the low-latitudes, FTEs are observed with which a high-speed flow mainly in the Y-direction is detected in the LLBL. The magnetosheath plasma is found to be mixed with magnetospheric one inside the LLBL. More over, reconnection in the cusp manifests the anti-parallel type, while that in the low latitudes is shown to be the sort of component reconnection. Possible connection between cusp reconnection and low latitude reconnection is discussed. Plausible role that the B_y-dominated connection plays in leading to plasma entry into the magnetosphere is also studied.

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