

Dynamics of the magnetotail flux tube inferred from the diamagnetic variation

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using the magnetic field and low-energy plasma data measured by MGF and LEP instrument on board Geotail satellite, magnetotail disturbances occurring in the nightside near-Earth plasma sheet are investigated.

According to Nakamizo and Iijima[2003], based on the common features confirmed on a number of disturbances observed by Geotail in the wide region of magnetotail plasma sheet, it has been mentioned that the compressional components of disturbances are ascribable to slow MHD mode and suggested that the occurrence of coupling between transverse Alfvén mode and slow mode. They also revealed the anisotropic stretching/shrinkage of flux tube derived from diamagnetic processes: stretching (shrinkage) parallel to the ambient magnetic field and simultaneous shrinkage (stretching) perpendicular to it.

Expanding the preceding study, we estimate spatial scales of the anisotropic flux tube motion and associated energy transports in parallel and perpendicular direction respectively and discuss how these energy transports contribute to the magnetotail convection process and change of current system.

Possible application to understanding the plasma sheet dynamics during substorm will also be discussed.