Low-latitude plasma mantle in the near-Earth magnetosphere: Its appearance and disappearance

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Examining Geotail plasma and magnetic field data, we have identified more than 100 plasma mantle events at the low-latitudes in the near-Earth magnetosphere. The disappearance of each mantle event is usually identified by the exit of the satellite to the lobe or the plasma sheet/low-latitude boundary layer. It is found that this is caused by the following IMF changes identified by WIND upstream of the Earth: (1) northward turning, (2) change of the sign of By, and (3) increase of the By magnitude. For most of the plasma mantle events substorm occurs. Consider the IMF control and the possible substorm effect on the dynamics of the magnetospheric boundary region, how its configuration responds to IMF changes and substorm development is examined.

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