



Plasma Beta and Magnetic Shear Dependence of the Occurrence of Magnetic Reconnection at the Magnetopause: THEMIS Observations

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We have performed a survey of the occurrence of reconnection at the dayside magnetopause observed by the THEMIS spacecraft. Reconnection signatures were absent in more than 50% of the high magnetic shear magnetopause crossings where reconnection might be expected. The controlling factors of whether reconnection occurs or not appear to be a combination of the magnetic shear across the magnetopause and the plasma beta in the adjacent magnetosheath. This beta and shear dependence of reconnection was also found in solar wind reconnection events observed by WIND and ACE, suggesting that this is a universal onset condition for reconnection.