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Reconnection at the Subsolar Magnetopause

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The shocked solar wind plasma first makes contact with the magnetosphere at the subsolar magnetopause. Thus observations in that region should be most relevant to the onset of reconnection. The bow shock controls the plasma conditions in the magnetosheath. High magnetosonic Mach numbers produce high beta plasma in this region, and low Mach number conditions produce low beta conditions in which the magnetic field is strong and presumably capable of strongly influencing the onset of reconnection and its subsequent effects. In this study, we examine magnetopause crossings in the near subsolar region using the magnetic field and plasma measurements of the MMS mission at times of both northward and southward IMF and high and low Mach number in the solar wind. We find strong flows in this region, high densities and high field strengths. Boundary layers as expected from Dungey-style reconnection for northward- and southward-IMF reconnection are observed.