

Geotail observations of dayside magnetopause reconnection I

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On 06 July 2013, Geotail observed the dayside magnetopause reconnection for a long time period. In the period 0000-0800 UT on 06 July 2013, the solar wind has an almost constant speed of 350 km/s and the Interplanetary Magnetic Field (IMF) is almost southward, having a value of (0.0, +4.5, -12.0 nT). Geotail traveled from the magnetosheath to the magnetosphere. The Geotail position is $(X_{gsm}, Y_{gsm}, Z_{gsm}) = (9.72, -2.23, -0.49 \text{ Re})$ at 0400 UT and $(8.91, 0.87, -1.73)$ at 0600 UT, respectively. Geotail stays in the vicinity of the magnetopause, almost in the front magnetosphere. Reconnection jets with a speed of 200 km/s are observed near the reversal of the magnetic field. The reconnection jets flow northward, indicating that the reconnection site is located south of the Geotail position. There are two cases in the magnetic field variations. In most cases, the B_z magnetic field component is dominant and the field reverses from southward to northward in the crossing into the magnetosphere, and the reconnection jets are almost field-aligned. However, the magnetic field becomes almost perpendicular to the north-south direction, and the positive B_y magnetic field component is dominant. The reconnection jets are convection flows. In this study, the magnetic field topology and its relationship to the jets are investigated.