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Multi-point observations of magnetopause boundary layers from the pre-noon to early morning flank

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During conditions of northward interplanetary magnetic field (IMF), the near tail plasma sheet is known to become denser and cooler. The mechanisms, and their efficiency, which allow for the formation of this cold dense plasma sheet (CDPS) are of great interest. Recent studies have shown that such plasma is transferred to the magnetosphere via poleward-of-cusp, lobe reconnection as well as via mechanisms at the flank magnetopause. In this case study we wish to add to these previous investigations in building a picture of the global response of the magnetosphere to such conditions

using multipoint measurements. On the 11th July 2006, during a period of northward IMF, the Geotail, Double Star 1 and Cluster spacecraft all crossed the magnetopause region within 2 hours (UT) of one another while separated by many hours in local time. During this time large-scale oscillations were observed in both ground based and spacecraft data. We utilize these numerous measurements to examine the structural evolution of the magnetopause boundary layer from the dayside round to the dawn flank. This works is being carried out as part of an International Space Science Institute (ISSI) working group on ‘Comparative Cluster- Double Star measurements of the Magnetotail’.