



Small scale plasma signatures of a high-latitude reconnection site.

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Recent investigations suggest predominantly component driven X-line regions on the dayside magnetopause, independent of guide field conditions and extending across a wide range of preferred, and often multiple, locations. Direct measurements of the ion diffusion region surrounding the magnetic X-line and null field are still relatively rare. We show simultaneous sampling, by four spacecraft in close formation, of the plasma signatures at a high-latitude reconnection site, where the guiding magnetic field orientations inside and outside the magnetopause are close to anti-parallel and the spacecraft locations are known relative to the magnetic X-line geometry, determined uniquely from the four spacecraft data. Clear evidence is obtained, both of expected structure surrounding a finite length X-line (from ion data) and of the repeatedly sampled central, small scale diffusion region (from electron data) and associated null magnetic field. The plasma populations confirm details of the ion and electron mixing, time history and acceleration through the current layer. Simultaneous monitoring of the local magnetosheath behaviour at lower latitudes by a fifth spacecraft suggests that sequential or multiple reconnection sites may be formed.