



The auroral and ionospheric flow signatures of dual lobe reconnection

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When the interplanetary magnetic field (IMF) is directed northwards, magnetic reconnection takes place not at low latitudes but at high latitudes, tailwards of the cusp opening. For orientations of the IMF that have a significant east-west component, an individual IMF field line is expected to reconnect with either the northern or southern magnetospheric lobe (single lobe reconnection or SLR). SLR can occur simultaneously in both hemispheres though with different IMF field lines. Dual lobe reconnection (DLR) refers to the occurrence of reconnection of an individual IMF field line with both lobes, postulated to occur when the IMF east-west component is close to zero. Despite being proposed in the 1960s, DLR has not previously been unambiguously identified. We discuss the expected signatures of DLR in ionospheric convection and auroral dynamics and present the first substantial evidence for the occurrence of DLR from SuperDARN measurements and IMAGE FUV/WIC observations. We also discuss the significance of this process for the formation of a cold, dense plasma sheet.