Current Sheet Structure during Plasma Sheet Thinning

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The plasma sheet is one of the key elements for understanding the dynamic phenomena in the earth's magnetosphere. The thickness of the current sheet is usually of the order of a few Re with a single peak current sheet, but a thin current sheet with the thickness of the order of ion inertia length is also known to exist during active phase. More detailed studies by Geotail and Cluster satellites revealed that a double and thin current sheet structure exists in the magnetotail. We will model the kinetic evolution of the current sheet in a one-dimensional slab geometry by using a particle-in-cell simulation. We argue the double and thin current sheet can be formed by increasing the magnetic energy in the lobe region, and discuss how the plasma is heated in the plasma sheet.