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Flux closure during magnetotail reconnection

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The ability to store magnetic energy from the solar wind, for later release, is a crucial part of magnetotail dynamics. Under which conditions is the magnetotail able to store energy, and how do the subsequent release of energy influence the dynamics in the tail? To address these questions, we have studied 13 reconnection event with in-situ Cluster observations from the current sheet and the reconnection region at about 19 R_E from the Earth. We find that reconnection usually occurs after a period of gradual current sheet thinning. The thickness decreases from 23000 km to 10000 km in about 50 minutes, on average. This thinning occurs whether or not there is a total pressure increase or a current sheet stretching in the same time interval. The lobe magnetic field, at reconnection onset, is very variable and highly dependent on solar wind parameters, but after unloading it decreases to a more stable value of about 22 nT. The observations indicate that reconnection does not occur when the lobe magnetic field is below this value. It has been estimated that the effective length of the nightside X-line must be about 30 R_E to accommodate the necessary flux transport in the tail. If this involves one or several X-lines, remains to be found.