



## Observations of Reconnection Onset at the Magnetopause

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Magnetic reconnection is an important process in plasmas which allows effective momentum and energy transfer across boundaries. Despite the fact that ongoing reconnection has been widely observed, the reconnection onset has been studied mainly in numerical simulations. We present Cluster spacecraft observations of several subsequent magnetopause crossings with density asymmetry and significant guide field  $B_M \sim B_0$  which show the evolution from a tangential to rotational magnetopause. At the initial stage the current sheet is narrow  $\sim c/\omega_{pi}$  and has a Harris-like structure. Strong lower hybrid drift waves are observed at the current sheet edges/density gradients. Small scale magnetic islands with depleted plasma and increased guide (core) field are observed inside the current sheet, indicating the reconnection onset. During later crossings a much thicker magnetopause is observed, consistent with ongoing reconnection.