

## Propagation of rarefaction waves in the near-Earth magnetotail at substorm onset

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It has been suggested that the disruption of the thin near-Earth current sheet is responsible for the onset of the substorm expansion phase. The current sheet disruption generates rarefaction waves propagating tailward, which lead current sheet thinning and transient earthward flows in the near-Earth magnetotail. Also, the rarefaction wave can trigger the formation of a new reconnection region in the mid-tail or increase the reconnection rate at a previously formed reconnection region. In this study we investigate the propagation of rarefaction waves in the near-Earth magnetotail using magnetohydrodynamic simulation. We examine the deformation of magnetotail due to the propagation of the rarefaction waves and the efficiency of current sheet thinning with respect to the parameters of the waves.