



Unsteady Magnetic Reconnection on Macroscopic Scales

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Within a MHD approach we find magnetic reconnection to progress in two entirely different ways. The first is well known: the laminar Sweet-Parker process. But a second, completely different and chaotic reconnection process is possible. This regime has properties of immediate practical relevance: (i) it is much faster, developing on scales of the order of the Alfvén time, and (ii) the areas of reconnection become distributed chaotically over a macroscopic region. The onset of the faster process is the formation of closed-circulation patterns where the jets going out of the reconnection regions turn around and force their way back in, carrying along copious amounts of magnetic flux.