

Abstract Submitted  
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**Unsteady reconnection in MHD models** GIOVANNI LAPENTA, KU Leuven — 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 [1]. 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. We further investigate the presence of unsteady reconnection regimes in the RSX experiment in Los Alamos [2]. Work in collaboration with: Intrator TP, Sun X, Dorf L and Furno I.

[1] Lapenta, G., Self-Feeding Turbulent Magnetic Reconnection on Macroscopic Scales, *Phys. Rev. Lett.* 100, 235001 (2008)

[2] Intrator TP, Sun X, Dorf L, Lapenta G and Furno I, Experimental onset threshold and magnetic pressure pileup for 3D reconnection, *Nature-Physics*, 5, 521 - 526 (2009)

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