

Abstract Submitted
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Fundamental limitation of a two-dimensional description of magnetic reconnection MARIE-CHRISTINE FIRPO, LPP, CNRS - Ecole Polytechnique — For magnetic reconnection to be possible, the electrons have at some point to “get free from magnetic slavery,” according to von Steiger’s formulation [1]. Stochasticity may be considered as one possible ingredient through which this may be realized in the magnetic reconnection process. It will be argued that non-ideal effects may be considered as a “hidden” way to introduce stochasticity. Then it will be shown that there exists a generic intrinsic stochasticity of magnetic field lines that does not require the invocation of non-ideal effects but cannot show up in effective two-dimensional models of magnetic reconnection. Possible implications will be discussed in the frame of tokamak sawteeth that form a laboratory prototype of magnetic reconnection.

[1] R. von Steiger, Space physics-grand challenges for the 21st century. *Front. Physics* 1:6 (2013).

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