

Abstract Submitted  
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**Barriers in the transition to global chaos in collisionless magnetic reconnection** D. BORGOGNO, Politecnico di Torino, D. GRASSO, ISC - CNR Italy, F. PEGORARO, Pisa University, T. SCHEP, Eindhoven University — The transitional phase from local to global chaos in the magnetic field of a reconnecting current layer is investigated. Regions where the magnetic field is stochastic exist next to regions where the field is more regular. In regions between stochastic layers and between a stochastic layer and an island structure, the field of the Finite Time Lyapunov Exponent (FTLE) shows a structure with ridges. These ridges, which are special gradient lines that are transverse to the direction of minimum curvature of this field, are approximate Lagrangian Coherent Structures (LCS) that act as barriers for the transport of field lines. The identification of the ridges as barriers is carried out adopting the technique of field line spectroscopy to analyze the radial position of a field line while it winds its way through partial stochastic layers and to compare the frequencies of the field line motion with the corresponding frequencies of the distinguished hyperbolic field lines that are the nonlinear generalizations of linear X-lines.

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