

Abstract Submitted
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Flux ropes, current sheets, islands and turbulence¹ T.P. INTRATOR, Los Alamos Natl Lab, J. SEARS, T. WEBER, D.T. LIU, D.R. PULLIAM, Los Alamos Natl Lab, A. LAZARIAN, Univ Wisconsin, G. LAPENTA, Univ. Katholique, Leuven Belgium — We describe earth bound laboratory experiment investigations of patchy, unsteady, bursty, magnetic field structures that are unifying features of magnetic reconnection and turbulence in helio, space and astro physics. Flux ropes are ubiquitous structures on the sun and the rest of the heliosphere. We use experimental probes inside the the flux ropes to macroscopic magnetic field lines, unsteady wandering characteristics, and dynamic objects with structure down to the dissipation scale length. We also show some theta pinch data that appear to be in the plasmoid formation regime for magnetic reconnection. Computational approaches are finally able to tackle simple 3D systems and we sketch some intriguing simulation results that are consistent with experimental data for magnetic reconnection and turbulence.

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