

Abstract Submitted
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Crossed flux tubes 3D magnetic reconnection experiment¹ PAUL BELLAN, Caltech — The formation and dynamics of writhing, plasma-filled, twisted open magnetic flux tubes is being investigated using laboratory experiments. The behavior of these flux tubes is relevant to solar corona loops, astrophysical jets, spheromak formation, and open field lines in tokamaks and RFP's. MHD forces have been determined to drive fast axial plasma flows into the flux tube from the boundary it intercepts. These flows fill the flux tubes with plasma while simultaneously injecting linked frozen-in azimuthal flux; helicity injection is thus associated with mass injection. An upgraded experiment under construction will have two adjacent arched plasma-filled flux tubes cross over each other. It is anticipated that a localized 3D reconnection will occur at the cross-over. This reconnection should result in half-twists in the post re-connection topology and subsequent Alfvén wave propagation to equilibrate the half-twists along the post-reconnection flux tubes. The electrical circuitry requires two initially independent floating capacitor bank power supplies that become series-connected as a result of reconnection.

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