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Flux Tube Dynamics Following Pellet Release Experi- ments in Laboratory Magnetospheres[1] D. GARNIER, M. DAVIS, M. MAUEL, M. ROBERTS, M. WORSTELL, Columbia University, M. CHILENSKI, J. KESNER, P. WOSKOV, MIT Plasma Science and Fusion Center — The rapid release of particles in the magnetosphere has allowed study of a wide range of space plasma dynamics including particle transport, magnetic bubble formation, and rapid flux-tube dynamics.[2] We report new experiments using the Levitated Dipole Experiment (LDX) (http://www.psfc.mit.edu/ldx/) where we explore the high-speed plasma dynamics following the release of 0.2 mm polystyrene pellets. The pellets are released into high-beta steady-state plasmas containing significant population of quasi-relativistic electrons. Similiar experiments, conducted in a smaller, mechanically-supported, laboratory magnetosphere show pellet "explosions," electron precipitation, "blob" formation, and rapid changes of plasma density. A variety of diagnostics are available, including microwave reflectometry, high-speed videography, multi-tip probe arrays, and accurate magnetic reconstruction. Results and analyses will be reported along with plans for futher efforts to increase plasma density and conduct a variety of controlled physics experiments associated with magnetospheric events.

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[2]Bernhardt, *Phys. Fluids B* **4**, 2249 (1992).

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