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**Design of a Magnetic Reconnection Experiment in the Collisionless Regime**[1] JOSEPH OLSON, JAN EGEDAL, CARY FOREST, JOHN WALLACE, UW-Madison, MPDX TEAM — In collisionless plasmas the electron diffusion region lies in different regimes depending on the pressure anisotropy, which is regulated by the properties of thermal electron orbits. In the presence of a guide magnetic field to magnetize the electrons, large scale current layers form extending to the system size [1]. In geometries with low upstream electron pressure the heating of the electrons becomes significant and relevant to observations in the magnetotail [2]. Utilizing the Madison Plasma Dynamo Experiment (MPDX) facility at UW-Madison a new reconnection experiment is now being implemented to address the role of electron pressure anisotropy in reconnection. This requires an experiment that accesses plasmas with much lower collisionality and lower plasma beta than are available in present experiments. The new experiment will be a major addition to the MPDX facility, including an insert with internal coils to drive reconnection. The insert is designed to supplement the ongoing dynamo experiments and to permit flexible reconfiguration of the magnetic geometry for a range of reconnection studies.

[1] Le A et el., PRL 110, 135004 (2013).
[2] Egedal J et al., Nature Physics, 8, 321 (2012).

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