Abstract Submitted
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Experiments and Diagnostics for Investigation of Shock Formation in Colliding Magnetized Plasma Flows ANDREW HAMILTON, JAMES CAPLINGER, VLADIMIR SOTNIKOV, Sensors Directorate, Air Force Research Laboratory, CHRIS PLECHATY, Riverside Research — The problem of producing collisional and collisionless shocks in the laboratory is of great interest for numerous space plasma applications[1]. One approach is based on the idea of combining the strong magnetic fields created during the vaporization and ionization of two parallel wires resulting in a high velocity plasma flow [2]. In support of laboratory experiment we propose to use pulse power generator with the following parameters: 2.5kA, 80kV, rise time of 5ns. Magnetic fields of 10^4 Gauss, very near the wires, are created due to the currents produced by the pulse power generator. This will allow us to investigate interaction of two colliding plasma flows with frozen magnetic fields in opposite directions. Parameters of the flow will correspond to that produced in the process of wire implosion experiments in the Antenna and Electromagnetic Technology Branch's Plasma Physics Sensors Laboratory (PPSL). Currently with the existing power in the pulse power generator collisional radiative shocks can be created in the vicinity of a reconnection region in such a system.

1. B.T. Draine and C.F. McKee, "Theory of Interstellar Shocks," Annual Rev. Astron. Astrophysics, 1993, pp. 373— 432.

2. M.A. Mal'kov and V.I. Sotnikov, "Lower Hybrid Drift Instability and Reconnection of Magnetic Field Lines of Force," Soviet Journal of Plasma Physics, Sept 1985, pp.626—631

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