Abstract Submitted
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Simulations of plasmas pentrating magnetic barriers[1] HERBERT GUNELL, West Virginia University, TOMAS HURTIG, Swedish Defence Research Agency, MARK KOEPKE, West Virginia University, NILS BRENNING, Royal Institute of Technology, Stockholm, HANS NILSSON, Swedish Institute of Space Physics — Perturbed currents perpendicular to the magnetic are generated by plasma motions in which the equilibrium magnetic field (and the corresponding equilibrium currents) are compressed, stretched, and deformed. One example of this is the Earth's magnetopause with its ever-present equilibrium transverse currents and its strong perturbations. Experiments have recently been performed using a plasma gun to shoot a plasma at a magnetic barrier (Brenning, et al., PoP, 2005). It was found that, at a critical drift that is about 2-3 times the ion thermal speed, non-linear oscillations in the lower hybrid range give rise to a resistivity which is at least 200-300 times the Spitzer resistivity. We present simulations of the above scenario for different values of the plasma kinetic energy density. We find waves with frequencies on the order of the plasma frequency. These waves contribute to the electron heating that has been observed both in the experiments and in previous simulations (Hurtig, et al., PoP, 2003).

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