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Magnetic Reconnection and Electron Energization from Whistlers in the Laboratory and in Simulations[1] C. CORREA, W. HORTON, G. MORENO, H.V. WONG, Applied Research Laboratory and the Institute for Fusion Studies, The University of Texas at Austin — Theory and simulations are developed to interpret laboratory experiments for nonlinear whistlers by Stenzel *et.al.* [R. Stenzel, J. M. Urritia, and K. D. Strohmaier, Plasma Phys. and Control. Fusion **50**, 074009 (2008)]. In that experiment, an alternating current induces large-amplitude magnetic fluctuations $\widetilde{B}_z$ that launch whistler waves in an Argon plasma with dimensionless electron pressure $\beta_e \approx 1$, electron skin depth of 50 mm and field- aligned scale length $L_z = 1.5m$. A field-reversed configuration that leads to 'spheromak' vortex configuration and X and O points. Magnetic reconnection accelerates electrons from the thermal energy of 3 to 5 eV up to 30 eV. The electron Hall dynamics of whistlers, including two Poisson bracket nonlinearities that give rise to vortex structes and pondermotive forces from the nonlinear magnetic pressure forces, are simulated using a two-fluid MHD nonlinear code. Structures of nonlinear whistlers similar to those observed in the experiment, and self-ducting are observed.

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