

Abstract Submitted
for the APR08 Meeting of
The American Physical Society

Experimental study of plasma bubble expansion as a model for extragalactic radio lobes¹ SCOTT HSU, LANL, ALAN G. LYNN, YUE ZHANG, UNM, WEI LIU, HUI LI, LANL, CHRISTOPHER WATTS, MARK GILMORE, UNM — Recent work in plasma astrophysics has suggested that magnetic energy features prominently in the large-scale evolution of active galaxies. The Plasma Bubble Expansion Experiment (PBEX) at UNM will conduct laboratory experiments to address outstanding nonlinear plasma physics issues related to how magnetic energy and helicity carried by extra-galactic jets interacts with the intergalactic medium to form extra-galactic radio lobe structures. A newly-built pulsed coaxial gun will form and inject magnetized plasma bubbles into a lower pressure weakly-magnetized background plasma formed by the helicon and/or hot cathode source in HELCAT, a 4 m long and 50 cm diameter linear plasma device. Plasma properties can be adjusted such that important dimensionless parameters are relevant to the astrophysical context. Ideal MHD simulations of the experiment have indicated the strong possibility of MHD shocks appearing. This poster will provide an overview of the physics goals, experimental design/status, and coordinated theory/modeling of PBEX.

¹Supported by NSF/DOE and LANL-LDRD.

Scott Hsu
LANL

Date submitted: 11 Jan 2008

Electronic form version 1.4