

Abstract Submitted  
for the DPP14 Meeting of  
The American Physical Society

**Injection of a coaxial-gun-produced magnetized plasma into a background helicon plasma** YUE ZHANG, ALAN LYNN, MARK GILMORE, Univ of New Mexico, SCOTT HSU, Los Alamos National Laboratory — A compact coaxial plasma gun is employed for experimental investigation of plasma bubble relaxation into a lower density background plasma. Experiments are being conducted in the linear device HelCat at UNM. The gun is powered by a 120-uF ignitron-switched capacitor bank, which is operated in a range of 5 to 10kV and 100 kA. Multiple diagnostics are employed to investigate the plasma relaxation process. Magnetized argon plasma bubbles with velocities 1.2Cs, densities  $10^{20} \text{ m}^{-3}$  and electron temperature 13eV have been achieved. The background helicon plasma has density  $10^{13} \text{ m}^{-3}$ , magnetic field from 200 to 500 Gauss and electron temperature 1eV. Several distinct operational regimes with qualitatively different dynamics are identified by fast CCD camera images. Additionally a B-dot probe array has been employed to measure the spatial toroidal and poloidal magnetic flux evolution to identify plasma bubble configurations. Experimental data and analysis will be presented.

Yue Zhang  
Univ of New Mexico

Date submitted: 10 Jul 2014

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