Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Pre- and Post-Shock Wave Self-Induced Magnetic Field Geometry in a Hypersonic Arc Driven Shock Tube[1] K.M. WILLAMS, J.B. TITUS, A.B. ALEXANDER, C.T. RAYNOR, M. SCOTT, J.A. JOHNSON, Florida A&M University — Using a version of the motional Stark Effect method based on relative line intensities to determine the internal magnetic field of the arc driven shock tube, a study comparing the magnetic field geometry before and after the primary and reflected shock wave plasma is conducted for different Noble gases. Using spectral line emissions from He, Ar, Kr, and other Noble gases measurements of the internal magnetic field of the shock tube are obtained. When the data for pre-primary shock region, post-primary shock region, pre-reflected and post-reflected shock regions are compared evidence of reconnection events is confirmed. When the magnetic field intensity and the direction evolve with turbulent energy, the B-field direction displays a discontinuity similar to a 2^{nd}-order phase transition.

[1]Research funded in part by the National Science Foundation and by the Department of Energy.

K. M. Willams
Florida A&M University

Date submitted: 18 Jul 2009 Electronic form version 1.4