Abstract Submitted
for the GEC08 Meeting of
The American Physical Society

Temperature Effects on Propagating Shock Waves in Glow Discharge Plasmas*[1] NIRMOL PODDER, AARON LOCASCIO, Troy University, Troy, AL — The time-history of the shock wave propagation in glow discharge plasma starting from the plasma switch-on or switch-off is produced. After a few tens of ms of the plasma switch-on, the photo acoustic deflection (PAD) profiles of the laser beams produced by the shock-front gas density gradients show increased signs of broadening, and both the shock wave propagation velocity and the laser deflection width start to increase nonlinearly as the temperature of the discharge is expected to rise from its room temperature value, and quickly reach their relatively fixed steady-state values at about 120 ms after the switch-on of the glow discharge at fixed discharge current 35 mA and gas pressure 15 Torr. At the plasma switch-off, the trend in the propagation velocity is reversed linearly, and that in the deflection width non-linearly as the afterglow plasma cools rapidly to its room temperature.

[1]This work is supported by the DOE.

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Date submitted: 13 Jun 2008 Electronic form version 1.4