Abstract Submitted
for the GEC09 Meeting of
The American Physical Society

Atmospheric Pressure RF Plasma Electrical and Optical Characteristics ALI GULEC, Suleyman Demirel University Turkey, LUTFI OKSUZ, NOAH HERSHKOWITZ, University of Wisconsin Madison — An atmospheric pressure 13.56 MHz RF source is used for plasma polymerization, nanocomposite deposition and for sterilization purposes. The air discharge electrical and optical characteristics are measured using monochromator and electrical probes. The addition of helium flow to the RF discharge system allows production of stable glow plasma discharge. The electron temperature and plasma densities are estimated using the emission lines of HeI and double probes. Emission of the He+air atmospheric pressure plasma is observed from the OH radical, several lines of the N_2, N_2^+ and atomic O, H and He lines. He flow rate and applied rf voltage affect on these emission spectra are investigated and the spectral lines are used for calculation of plasma parameters. Plasma electron temperature is calculated using HeI lines and compared with double probe data. The OI 777 and H_α 656 lines are also investigated by varying the applied voltage and He flow rate. The calculated electron temperature was approximately 0.2 eV and dependent on the He flow rate and applied power.

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Date submitted: 15 Jun 2009 Electronic form version 1.4