FAST GAS HEATING IN FAST IONIZATION WAVE DISCHARGE: EXPERIMENT AND MODELLING

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The fast ionization wave (FIW) resulting from nanosecond pulsed discharge at very high overvoltage provides an excellent high reduced electric field (E/N) example discharge due to its spatial uniformity. A comprehensive model of FIW would provide insight into other high E/N discharges used for plasma ignition applications, such as DBD and streamer discharge[1]. To that end the mechanism of fast gas heating due to dissociation, relaxation, and recombination is investigated[2]. Spectroscopic methods were used to measure temperature during and after the discharge. Preliminary results are presented and the agreement between modeling and experiment is discussed. Future experiments are proposed in order to better understand FIW and to apply the results to other discharges in plasma ignition applications.

[1]S. M. Starikovskaia, Journal of Physics D: Applied Physics **39**, R265 (2006).
[2]N.A. Popov, Plasma Physics Reports **27** (10), 886 (2001).

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