Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Plasma Globe Filamentary Structure and Propagation Trends by Voltage Waveform Change H.G. CEJA, M.J. BURIN, G.G. SIMMONS, CSUSM, A. NAGY, S.J. ZWEBEN, PPPL — Filamentary structures are seen in many types of plasma discharges. However, principal aspects of their physics are unclear. In order to study plasma filaments we have used popular commercial plasma globes, which typically have a Neon based mixture near atmospheric pressure. Previous work has provided initial estimates of the speed of plasma globe filaments [Campanell et al. 2010]. Our work analyzes the effects of voltage amplitude and frequency on filament speed and structure using a programmable high voltage supply with phase triggered high-speed photography. Observed trends are discussed in detail along with their possible relation to discharge structures found in nature (e.g. lightning leaders) and various industrial applications.

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Date submitted: 11 Jul 2014 Electronic form version 1.4