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Formation and Propagation of the Plasma Bullets Emitted by a Pulsed Plasma Jet ASMA BEGUM, ERDINC KARAKAS, MOUNIR LAROUSSI¹, Old Dominion University — Recently non-thermal atmospheric pressure plasma jets have been playing an important role in plasma processing including biomedical applications. This is due to the ability of providing plasmas not confined by electrodes. In this paper we report experimental investigations on the characteristics of the plasma jet emitted by a pulsed plasma generator, the “Plasma Pencil”. Two ring electrodes attached to the surface of alumina disk are inserted in a dielectric tube and separated by a small gap. One of the two electrodes is connected to a high voltage pulse generator. Using ICCD we show that the plume is a series of plasma packets/bullets traveling at high velocities. Correlation between the discharge current and ICCD images reveals when and how the bullets are emitted from the device. Using optical emission spectroscopy, we will present spatially resolved emission spectra which give indications of the evolution of the various chemical species contained in the plasma bullets. In addition, we will show the effects of an external electric field and gas flow on the evolution and chemistry of the plasma bullets.

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