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Control of Plasma Jet Dynamics by Externally Applied Electric Fields[1] NATALIA YU. BABAEVA, GEORGE V. NAIDIS, Joint Inst. High Temp. Russian Academy Sci., MARK J. KUSHNER, University of Michigan — Atmospheric pressure plasma jets (APPJs), as used for biomedical applications, consists of a tube through which a noble gas mixture flows into the ambient, and which sustains and guides an ionization wave (IW). Short-pulsed voltages applied to external electrodes and synchronized to the passage of the IW can control the dynamics of the IW. Computations and experiments have shown that voltage pulses applied to a ring electrode around the axis of the IW can decrease or increase the speed of the IW depending on polarity [1,2]. In this paper, positive and negative voltage pulses applied to external electrodes are computationally are studied using the 2D *nonPDPSIM* model [3]. Using a negative He APPJ into air, we show that a positive voltage pulse on the external electrodes increases the electric field in the leading edge of the IW, and increases the IW's radius and velocity. A negative voltage pulse reduces the IW electric field and decreases its radius, velocity and electron density. Consequences of multiple and staggered external electrodes will be discussed. [1] G. Naidis, J. Walsh, J. Phys. D. **46** (2013) 095203. [2] P. Olszewski et al. Plasma Src. Sci. Technol. **23** (2014) 015010 [3] S. Norberg, et al., Plasma Src. Sci. Technol. **24** (2015) 035026.

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