

Abstract Submitted  
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**Measurements of the propagation velocity of an atmospheric pressure plasma plume by various method**<sup>1</sup> XINPEI LU, College of EEE, HUST, Z. XIONG, Q. XIONG, Y. XIAN, C. ZOU, W. GONG, J. LIU, F. ZOU, Z. JIANG, J. HU, Y. PAN, COLLEGE OF EEE, HUST TEAM — The propagation behavior of atmospheric pressure plasma plumes has recently attracted lots of attentions. In this paper, five different methods are used to measure the propagation velocity of an atmospheric pressure plasma plume. The first method, called the “current method,” obtains the propagation velocity of the plasma plume by measuring the currents carried by the plasma plume at different positions. The second method, called “voltage method,” obtains the plume propagation velocity by measuring the voltage at different positions along the plasma jet with a voltage divider. The third method, called “charge method,” which significant interferes with the plume propagation, estimates the plume propagation velocity by measuring the charges deposited on the surface of a quartz tube. The fourth method, which is noninterference method, obtains the plume propagation velocity by capturing the dynamics of the plasma plume with an ICCD camera. Finally, the fifth method, estimates the plume propagation velocity based on the temporal optical emission intensity measurement of selected species by using a spectroscopy. The experimental results show that plasma plume velocities obtained from the five methods have reasonable agreement with each other.

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