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**Dynamics of turbulent front at the correlation between atmospheric pressure plasma jet & gas flow field.** MAEDE GHASEMI, HAITAO XU, XUEKAI PEI, XINPEI LU, Huazhong University of Science and Technology — Among variety of plasma applications, there is significant interest recently in the use of plasma as an actuator in flow control for aerodynamic applications in which the correlation between atmospheric pressure plasma jet (APPJ) and gas flow field is a crucial role. In this contribution, dynamic characterizations of the turbulent flow field in APPj are investigated by focusing on the effect of different parameters of APPJ, such as applied voltage, pulse repetition frequency, gas flow rate, and time duration of the pulse. We utilized Schlieren photography and photomultiplier tubes (PMT) as a signal triggering of an intensified charge coupled device (ICCD) and also a high speed camera to examine the formation of the turbulent front and its dynamics. The results reveal that the turbulent front will appear earlier and closer to the tube nozzle by increasing the gas flow rate and applied voltage amplitude. It is found that the pulse time duration and repetition frequency cannot change the dynamics and formation of the turbulent front. Further investigation demonstrated that every pulse can excite one turbulent front which is created in a specific position in a laminar region and propagates downstream and the effect of increasing frequency results in the increasing of the number of turbulent front and expansion of their region of formation.

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