Abstract Submitted
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Discharge characteristics and hydrodynamics behaviors of atmospheric plasma jets produced in various gas flow patterns[1] YUICHI SETSUHARA, GIICHIRO UCHIDA, ATSUSHI NAKAJIMA, KOSUKE TAKENAKA, Osaka University, KAZUNORI KOGA, MASAHARU SHIRATANI, Kyushu University — Atmospheric nonequilibrium plasma jets have been widely employed in biomedical applications. For biomedical applications, it is an important issue to understand the complicated mechanism of interaction of the plasma jet with liquid. In this study, we present analysis of the discharge characteristics of a plasma jet impinging onto the liquid surface under various gas flow patterns such as laminar and turbulence flows. For this purpose, we analyzed gas flow patters by using a Schlieren gas-flow imaging system in detail The plasma jet impinging into the liquid surface expands along the liquid surface. The diameter of the expanded plasma increases with gas flow rate, which is well explained by an increase in the diameter of the laminar gas-flow channel. When the gas flow rate is further increased, the gas flow mode transits from laminar to turbulence in the gas flow channel, which leads to the shortening of the plasm-jet length. Our experiment demonstrated that the gas flow patterns strongly affect the discharge characteristics in the plasma-jet system.

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