

AAPPS-DPP2022 and/or APPC-15 Invited/Plenary Nomination Form

0. **Recommender's name, E-mail, and affiliation**

Name: JJ Shi

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Affiliation: Donghua University

1. **Conference(s): select option 1) or 2) or 3)** (strikethrough or delete)

1) AAPPS-DPP2022

2. **Session category:** Choose one of the sessions categories - **CD**:Cross Disciplinary, **F**:Fundamental, **B**:Basic, **A**:Applied, **L**:Laser, **SG**:Space & Geomagnetism, **SA**:Solar & Astro, **MF1**:Magnetic Fusion(core), **MF2**: MF(edge) (strikethrough or delete)

AAPPS-DPP 2022: A

3. **Type:** Invited

4. **Speaker: Xuechen Li**

Name: Xuechen Li

E-mail: xuechenli@126.com; xcli@mail.hbu.edu.cn

Affiliation: Hebei University, China

5. **Rationale:**

Dr. Xuechen Li is now the Professor of Hebei University, Member of the Plasma Science and Technology Committee of the Chinese Society of Theoretical and Applied Mechanics, Member of the Plasmas and Their Applications Committee of China Electrotechnical Society, etc. He focuses his research interests on low temperature plasma fundamental and application, especially on atmospheric pressure discharge simulation and experiment for more than 10 years and some important progresses have been achieved through the continuing efforts on this field. These progresses have been recognized by the international colleagues. More than 80 peer reviewed papers have been published in this field. In recent years, his research group focuses on the experimental and mechanism for plume morphology and streamer dynamic behavior of atmospheric pressure plasma jet. Several interesting plume morphologies have been observed, from which the mechanisms of different streamer behaviors have been revealed. It is believed that this study will be of broad interest to the low temperature plasma community, due to a wide range of applications of atmospheric pressure plasma jet in surface modification, material synthesis, sterilization and other fields.

6. **Short abstract for 6th Asia-Pacific Conference on Plasma Physics, APPC-15**

Authors: Xue-chen Li, Jun-yu Chen, Jia-cun Wu, Kai-yue Wu, Peng-ying Jia, Dong-dong Wang

Title: Investigation on morphologies of plasma plume and dynamics of propagating streamer in an atmospheric pressure argon plasma jet

Short Abstract: Without the need for a vacuum device, atmospheric pressure plasma jet can generate a remote plasma plume in open air ambient, which is abundant with active species. Due to these advantages, plasma jet has great potential for applications spanning from biomedicine, biocatalyst, nano-material synthesis, surface modification, to many other fields. Plasma jet fed with inert gas normally operates in a streamer regime. Streamer behaviors determine the distribution of active species, hence play an important role in plasma jet applications. Usually, different streamer behaviors lead to various morphologies of plasma plume. In this work, several plume morphologies have been observed downstream of an atmospheric pressure argon plasma jet, which including a regular swelling shape, a conical morphology, a snake-like plume, and a compound structure. All the plume morphologies mentioned above are investigated by fast photography to reveal the streamer dynamics in plasma jet. Results indicate that negative streamer is relatively fat, which always propagates along a straight line. In contrast, positive streamer is very thin, which may propagate along a distorted curve besides the straight-line propagation. A two-dimensional fluid model is employed to numerically investigate the dynamic behavior of positive streamer, which reveals that the distorted propagation results from the influence of residual ions in the argon stream.