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Pseudo-continuous meter-scale microwave plasma production under atmospheric pressure HIROTAKA TOYODA, HARUKA SUZUKI, SUGURU NAKANO, Nagoya University, HITOSHI ITOH, Tokyo Electron Ltd, MAKOTO SEKINE, MASARU HORI, Nagoya University — Atmospheric pressure plasmas (APP) have been given much attention because of its cost benefit and a variety of possibilities for industrial applications such as large area processing. We have been studying production of a pseudo-continuous meter-scale 2.45 GHz microwave APP source which consists of a loop-structure waveguide antenna and a circulator. Plasma is produced inside a meter-length slot of the waveguide and pseudo-continuous plasma is realized by fast movement of small (a few mm in length) plasmas along the slot. In this study, plasma behavior is investigated by a high-speed camera and an ICCD camera to give insight into the mechanism of the plasma movement. In emission intensity profile along the slot from a single plasma, asymmetric structure and higher emission intensity was observed in the vicinity of the plasma edge of the microwave downstream side, suggesting the plasma movement was induced by the asymmetric ionization rate in the single plasma. Origin of such asymmetric structure was investigated using a simulation of three-dimensional electromagnetic field.

HirotaKa Toyoda
Nagoya University

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