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Electromagnetic Simulation of Long-Slotted Waveguide Antenna for Production of Meter-Scale Plasma under Atmospheric Pressure HARUKA SUZUKI, SUGURU NAKANO, Nagoya Univ., HITOSHI ITOH, PLANT, Nagoya Univ., Tokyo Electron Ltd., MAKOTO SEKINE, MASARU HORI, HIRO-TAKA TOYODA, Nagoya Univ., PLANT, Nagoya Univ. — Atmospheric pressure plasmas have been given much attention because of its high cost performance and a variety of possibilities for industrial applications. In various kinds of plasma production techniques such as corona discharge, DBD, pulsed-microwave discharge plasma using slot antenna is attractive due to its ability of high-density plasma production. In this plasma source, however, size of the plasma has been limited up to a few cm in length due to its plasma production mechanism and increase in the plasma size was difficult. In this study, we have successfully increased the length of the slot-antenna plasma source up to 0.7 m by microwave power flow control inside the waveguide. In this plasma source, reflected power that induces standing wave is suppressed and long plasma is produced only by traveling waves inside a long slot. Three-dimensional electromagnetic field simulation is conducted and spatial slight fluctuation of the microwave power, i.e., standing wave, caused by slight reflection power at the end of the long slot antenna is investigated from the simulated result. Relation between spatial fluctuation of the microwave power and the emission intensity will be discussed.

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