Abstract Submitted
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Space-resolved oxygen radical measurement of atmospheric pressure microwave line plasma using vacuum ultraviolet absorption spectroscopy[1] HANSIN BAE, HIROTSUGU KOMA, HARUKA SUZUKI, HIROTAKA TOYODA, Nagoya University, SEIGO TAKASHIMA, Nagoya Industries Promotion Corporation — Atmospheric pressure plasma is attractive due to its cost benefit and a variety of possibilities for industrial applications. Recently, we have developed atmospheric pressure microwave line plasma (APMLP) source of ~1 m in length, using a loop waveguide with a long slot and a microwave circulator that can control energy flow in one direction. In our previous work, we have confirmed spatial uniformity of electron density (~10^{20} m^{-3}), gas temperature, and light intensity of the APMLP[1]. However, in view of the industrial application, not only plasma parameters measurement but also radical density measurement is important. In this study, O radical density of the APMLP is measured by vacuum ultra violet absorption spectroscopy (VUVAS). In the case of ~0.1% O_2-admixed Ar, uniform O radical density of 1x10^{13} cm^{-3} in longitudinal length of 60 cm was observed. To give an insight into not only the radical density but also the radical flux, uniformity of the gas flow in the longitudinal direction was observed using a differential pressure gauge facing to the gas flow from the slot and uniform gas flow in the longitudinal direction was confirmed. [1] H. Toyoda et al.: 10^{th} Int. Workshop on Microwave Discharge (Zvenigorod, 2018).

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