Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Influences of Liquid Temperature and Pressure on Microwave-Excited Bubble Plasma Production TATSUO ISHIJIMA, KOUJI KANETAKE, HARUKA SUZUKI, HIROTAKA TOYODA, Nagoya Univ. — So far, we have developed slot-antenna excited microwave discharge source as a novel technique for plasma production in liquids, and have pointed out the importance of bubbles in the vicinity of slot antenna for microwave plasma production [1]. In this study, we will report influences of liquid temperature and operating pressure on the plasma production in de-ionized water. Microwave was injected into a vacuum-tight vessel that is filled with de-ionized water with or without organic solutes at various water temperatures and ambient pressures. Decrease in the breakdown microwave power was observed when the water temperature was increased or the pressure was decreased, i.e., when the pressure inside the vessel is close to the saturated vapor pressure. These results suggest that reduction of microwave power that is required for the bubble production inside the water is important to suppress the breakdown microwave power. The power efficiency for the solute decomposition at various water temperatures and the pressures will be also discussed.

[1] T. Ishijima, H. Sugiura, R. Saito, H. Toyoda and H. Sugai, Plasma Sources Sci. Technol., **19**, 015010 (2010).

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Date submitted: 11 Jun 2010 Electronic form version 1.4