Abstract Submitted
for the GEC20 Meeting of
The American Physical Society

Gas-liquid Interfacial Plasma Using High-speed Liquid Flow for Analyzing Short-lived Reactive Species Transport[1] TOSHIRO KANEKO, KAZUKI TAKEDA, KEISUKE TAKASHIMA, SHOTA SASAKI, Graduate School of Engineering, Tohoku University, INTERDISCIPLINARY RESEARCH CENTER FOR NON-EQUILIBRIUM PLASMA (IRCNP) TEAM — Atmospheric-pressure plasmas (APPs) have recently emerged as a novel technology for life science (medical and agricultural) applications. Although APP-produced short-lived reactive species in the liquid phase could be key factors in their applications, the analysis of the short-lived reactive species transport is still challenging due to their high reactivity and coexisting various species. In order to analyze decay of OH radical (one of important short-lived reactive species) in APP-exposed water, we developed a He-APP device with high-speed (˜10 m/s) liquid flow. This system gives a high temporal resolution measurement of OH radical in the liquid phase. We have experimentally measured APP-produced OH radical decay and showed a space-time distribution of OH radical based on a reaction-diffusion model which is consistent with the experimentally obtained OH radical decay.

[1]This work was partially supported by JSPS KAKENHI Grant Number 18H03687.

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Date submitted: 12 Jun 2020 Electronic form version 1.4