

Abstract Submitted
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Generations and accessibilities of field-emitting surface dielectric barrier discharges in various environments MORIYUKI KANNO, RYO TANAKA, SVEN STAUSS, TSUYOHITO ITO, KAZUO TERASHIMA, The University of Tokyo — Discharges are often used for providing charges and charging is applied for separating toxic particles in environments, material analysis, and so on. To avoid high reactivities, discharges without breakdown are sometimes required. When electrons are provided via field emissions, ionizations are not required for sustaining discharge and thus electron energy could be kept low for avoiding high reactivity. Such discharge mode in surface dielectric barrier discharges have been achieved in high-pressure CO₂ including supercritical fluids and in silicone oil. The mode was named as field-emitting surface dielectric barrier discharge (FESDBD) [1] and its applicability for charging particles has been demonstrated [2]. In order to verify its generality, we experimentally investigated the possibility of FESDBD generations even in Ar or N₂ gases. In addition, we will show that the accessibility to the FESDBD mode depending on the environmental species could be qualitatively expected via a Townsend-based theory. The details will be presented at the conference. [1] D. Z. Pai, *et al.*, *Plasma Sources Sci. Technol.*, **23** 25019 (2014). [2] T. Kawamura, *et al.*, *J. Appl. Phys.*, **123** 043301 (2018).

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