Abstract Submitted
for the GEC19 Meeting of
The American Physical Society

Parametric study of TiN deposition with field-emitting surface dielectric barrier discharge MORIYUKI KANNO, TSUYOHITO ITO, KAZUO TERASHIMA, The University of Tokyo — Field-emitting modes of discharges are useful tools to provide charges without significant reactivity and such mode in surface dielectric barrier discharge has been demonstrated in high-density fluids [1-3]. The ability of this discharge, which we named as field-emitting surface dielectric barrier discharge (FESDBD), to provide charges to materials has been also demonstrated recently [2]. In this study, we demonstrate electrophoretic deposition (EPD) of TiN films from TiN nanoparticles charged via FESDBD and its dependence on several processing parameters, such as voltage for FESDBD, the substrate bias, and deposition time. The deposition speed depends on the FESDBD voltage as well as the substrate bias. Furthermore, it has been found that deposition time dependence of the film thickness is well represented by Hamaker's mass balance law [4], indicating the deposition speed also depends on the particle density in the environment. Further details will be presented in the conference with benefits of FESDBD application for EPD. [1] D. Z. Pai *et al.*, *Plasma Sources Sci. Technol.*, **23** 25019 (2014). [2] T. Kawamura *et al.*, *J. Appl. Phys.*, **123** 043301 (2018). [3] M. Kanno *et al.*, *AIP Advances*, **9** 055111 (2019). [4] S. Put *et al.*, *Acta Mater.*, **51** 6303 (2003).

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Date submitted: 02 Jun 2019 Electronic form version 1.4