Abstract Submitted
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Traces of Accumulated Charges on Dielectric Electrode in Self-Organization in Barrier Discharge Generated by Piezoelectric Transformer HARUO ITOH, Chiba Institute of Technology, KENJI TERANISHI, The University of Tokushima, KAZUTO KOBAYASHI, Chiba Institute of Technology, NAOYUKI SHIMOMURA, The University of Tokushima, SUSUMU SUZUKI, Chiba Institute of Technology — Discharge plasmas excited by nano-meter longitudinal vibration of piezoelectric transformers (PTs) has been investigated to construct compact plasma reactors for practical applications. In the experiments aimed to develop a PT-based excimer lamp, self-organization phenomenon in the DBD [1] was observed as regularly hexagonal patterns of microdischarges in He and Ar with a small amount of air impurities [2]. Time-resolved observation of the self-organized patterns is performed by ICCD camera to clarify the phenomenon. In the images, we found dark spots arrayed hexagonally in a weak emission on the PT surface whose arrangement well coincides with that of bright hexagonal filaments. The dark spots are considered as the traces of the accumulated charges on the dielectric electrode, which interrupt the hexagonally-filamentary discharges. [1] L. Stollenwerk et al., Phys. Rev. Lett., 98, 255001 (2007) [2] H. Itoh et al., IEEE Trans. Plasma Sci., 36, 1348 (2008).

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