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The effects of surface characteristics on the spatio-temporal excitation dynamics in capacitive RF plasmas studied by $PROES^1$ STEVEN BRANDT, Department of Physics, West Virginia University, USA, JU-LIAN SCHULZE, BIRK BERGER, Department of Physics, West Virginia University, USA; Insitute for Electrical Engineering, Ruhr-University Bochum, Germany, MARK KOEPKE, Department of Physics, West Virginia University, USA, DOU-GLAS KEIL, Lam Research Corporation, Tualatin, USA — In commercial capacitively coupled radio frequency plasmas (CCPs), surface characteristics can change as the chamber conditions drift between clean cycles. The effects of these drifts on the electron heating dynamics and, consequently, on plasma parameters are unclear. In order to clarify these effects we place aluminum discs with varying surface roughness or AIF film thickness on the powered electrode of a GEC reference cell and study their effects on the spatio-temporal electron impact excitation dynamics by Phase Resolved Optical Emission Spectroscopy (PROES). Measurements are performed in argon plasmas driven at 13.56 MHz and at different pressures as well as voltages. Special attention is paid to effects induced by a change of the secondary electron emission coefficient as a function of surface roughness and film thickness traced by monitoring the relative intensity of electron impact excitation induced by sheath expansion heating and by secondary electrons.

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