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The effects of realistic heavy particle induced secondary electron emission coefficients on the electron power absorption dynamics in capacitively coupled plasmas[1] JULIAN SCHULZE, MANASWI DAKSHA, Ruhr-University Bochum, Germany, ARANKA DERZSI, Wigner Research Centre for Physics, Hungary, SEBASTIAN WILCZEK, JAN TRIESCHMANN, Ruhr-University Bochum, Germany, THOMAS MUSSENBROCK, Brandenburg University of Technology, Germany, PETER AWAKOWICZ, Ruhr-University Bochum, Germany, ZOLTAN DONKO, Wigner Research Centre for Physics, Hungary — The effects of implementing energy-dependent secondary electron emission coefficients (SEEC) for ions and fast neutrals in PIC/MCC simulations of single and dual frequency capacitive discharges operated in argon are investigated. The surface conditions are taken into account, i.e. clean (heavily sputtered) and dirty (e.g. oxidized) metal surfaces are used. In single-frequency discharges the pressure and voltage at which the transition between the α- and γ-mode occurs are found to be significantly different compared to simulations based on constant SEECs and to strongly depend on the surface conditions. In classical dual-frequency discharges the effective SEEC significantly increases as a function of the low-frequency voltage amplitude for dirty surfaces due to its effect on the heavy particle energies at the electrodes. This is found to negatively influence the quality of the separate control of ion properties at the electrodes. These new results on the separate control of ion properties indicate significant differences compared to previous results obtained with constant SEECs.

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