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**A computationally assisted spectroscopic technique to measure secondary electron emission coefficients in technological rf plasmas** BIRK BERGER, JULIAN SCHULZE, Department of Physics, West Virginia University; Institute for Electrical Engineering, Ruhr-University Bochum, MANASWI DAKSHA, EDMUND SCHUENGEL, MARK KOEPKE, Department of Physics, West Virginia University, IHOR KOROLOV, ARANKA DERZSI, ZOLTAN DONKO, Hungarian Academy of Sciences — A Computationally Assisted Spectroscopic Technique to measure secondary electron emission coefficients (y-CAST) in capacitive rf plasmas is proposed. This non-intrusive, sensitive diagnostic is based on a combination of Phase Resolved Optical Emission Spectroscopy and PIC simulations. Under most conditions in electropositive plasmas the spatio-temporally resolved electron-impact excitation rate features two distinct maxima adjacent to each electrode at different times within one rf period. One maximum is the consequence of an energy gain of the electrons due to sheath expansion. The second maximum is produced by electrons accelerated towards the plasma bulk by the sheath electric field at the time of maximum voltage drop across the sheath. Due to the different excitation mechanisms the ratio of the intensities of these maxima is very sensitive to y, which allows for its determination via comparing the experimentally measured excitation profiles with corresponding simulation data obtained with various y-coefficients. This diagnostic is tested here in a geometrically symmetric reactor, for stainless steel electrodes and argon gas. An effective secondary electron emission coefficient of y=0.067+-0.010 is obtained, which is in excellent agreement with previous experimental results.

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