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Computationally assisted in-situ measurement of secondary electron emission coefficients in CCPs[1]

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In simulations of technological plasmas, the choice of the heavy-particle induced secondary electron emission (SEE) coefficient (γ) is crucial. However, there is a lack of data available regarding γ for different particle species and surfaces. In order to obtain a realistic value for γ in RF plasmas, a computationally assisted spectroscopic technique (the γ-CAST method) has been introduced [Daksha et al. 2016 *J. Phys. D: Appl. Phys.* **49** 234001], which is a quantitative implementation of searching for the best match between the spatio-temporal distribution of the excitation rate obtained by phase resolved optical emission spectroscopy (PROES) and the ionization rate obtained by simulations, by varying the SEE coefficient. This method is revisited in this work for CCPs operated in noble gases. The comparison of experimental and computational data results in remarkably different spatio-temporal distributions of the excitation and ionization rates in neon, revealing the limitations of PROES to probe the discharge operation mode. This talk summarizes the applicability of computationally assisted spectroscopic techniques to measure in-situ effective γ-coefficients for numerical plasma simulations.

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