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Electron dynamics in micro atmospheric pressure radio frequency plasma jets[1] LENA BISCHOFF, GERRIT HUEBNER, IHOR KOROLOV, JULIAN HELD, VOLKER SCHULZ-VON DER GATHEN, Ruhr-University Bochum, Germany, THOMAS MUSSENBROCK, YUE LIU, Brandenburg University of Technology, Cottbus, Germany, PETER HARTMANN, ZOLTAN DONKO, Hungarian Academy of Sciences, Budapest, Hungary, JULIAN SCHULZE, Ruhr-University Bochum, Germany, West Virginia University, USA, PROJECT A4 TEAM — Radio frequency driven micro atmospheric pressure plasma jets (μ-APPJ) are often used as efficient sources of reactive species at low temperatures for, e.g. biomedical applications. Reactive species can be generated via electron impact excitation/dissociation of the neutral gas. To understand these processes, we investigate the electron dynamics in a μ-APPJ operated at 13.56 MHz in $He/O_2/N_2$ by phase resolved optical emission spectroscopy using different emission lines. The results show that the spatio-temporal excitation dynamics obtained from the plasma emission at different wavelengths are different. This effect is explained by different energy thresholds of the electron impact excitation of the corresponding excited state and generally by the shape of the corresponding cross section. Thus, different parts of the electron energy distribution function are probed by using different emission lines and a careful selection of the emission lines is required to determine the mode of discharge operations.

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