SPECTROSCOPIC INVESTIGATION OF DISCHARGE AND AFTERGLOW PHASE OF MICROSECOND PULSED GLOW DISCHARGE

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Abstract. This work focuses on the spatial and temporal characteristics of a pulsed Grimm-type glow discharge operated with 30 – 60 μs power pulses in argon (Krstić et al. 2020) with frequency of 5 kHz and currents of 20, 40 and 60 mA. The emission characteristics of the discharge are studied to obtain insight into the excitation and recombination processes of atoms and ions of argon fill gas and copper sputtered material. Properties of representative line emissions during the discharge and the afterglow periods of the discharge pulse were analyzed. Two groups of lines can be differentiated according to the time development. Atomic lines with the low energy of the upper level have a strong initial peak at the beginning of the discharge pulse, and a small afterpeak, see Fig. 1. Lines from high energy levels show the opposite behavior: small initial peak and a strong afterpeak. For the more detailed investigations of the energy and charge transfer processes, hydrogen has been added to the argon with different percentages.

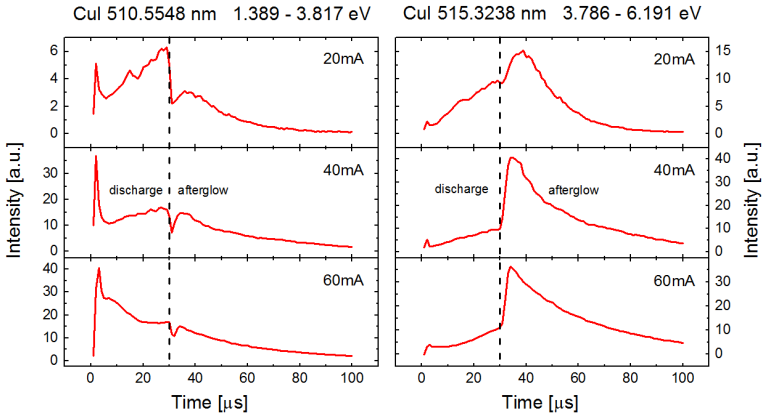

Figure 1: Time dependent emission of representative Cu I lines.

References

Krstić, I.B., Obradović, B.M., Kuraica, M.M.: 2020, *J. Instrument.*, 15 (1) C01006.