Progress Report

ON THE SPECTRAL SHAPES OF Ne II LINES RECORDED FROM THE CATHODE FALL REGION OF AN ABNORMAL GLOW DISCHARGE

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We present an iterative kinetic model of the cathode-fall region in an abnormal glow discharge of pure neon, which enables determination of the distribution of electric field strength E, the distribution of the number densities of Ne atoms and Ne^+ ions together with the spectral shapes of Ne I and Ne II lines recorded end-on and side-on at various distances from the cathode. We compare our model predictions with corresponding experimental electric field strength distributions determined from Ne I 515.443 nm line recorded side-on under same experimental conditions. These Ne I line recordings enable experimental determination of the electric field distribution via measurement of the Stark shift $\Delta\lambda$ and by using the Stark shift coefficient C in a well known quadratic relation $\Delta\lambda = -\lambda^2 CE$; the value of C is reported in Ivanović et al. 2017. Furthermore, we compare the model prediction for the shape of Ne II 371.308 nm spectral line which serves as a test for validity of our theoretical model.

References

Ivanović, N. et al.: 2017, *J. Phys. D: Appl. Phys.*, **50**, 125201.