Poster

SPECTROSCOPIC DIAGNOSTICS OF THE ELECTRON DENSITY IN CORONA DISCHARGES

J. Rosato[1], N. Bonifaci[2] and R. Stamm[1]

[1]*Aix-Marseille Université, CNRS, PIIM UMR 7345, 13397 Marseille Cedex 20, France*
[2]*Laboratoire G2Elab CNRS and Grenoble University, 25 rue des Martyrs, 38042 Grenoble, France*

E-mail: joel.rosato@univ-amu.fr

Experiments have been carried out in gaseous He at the fixed temperature of 300 K and different pressures in the cell from 0.1 MPa up to 2 MPa. A corona discharge (ionization of gaseous He) has been performed at the vicinity of a tip electrode under high voltage. The discharge domain (ionization zone) has a volume less than an inter-electrode space (drift zone). The corona current has been measured for different pressures in a space-charge-limited regime. Spectroscopic observations of the light can be used to determine information of the local environment of the emitting atoms or molecules. The optical emission spectrum from impurities, like hydrogen, can also be used. In this work, we report on an investigation of hydrogen and helium spectral profiles and their dependence on the discharge current and pressure. It is shown that the electron density can be inferred from the Stark broadening of these lines.