

Abstract Submitted
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Simulation of low temperature atmospheric pressure corona discharge in helium¹ V BEKASOV, ALEX CHIRTSOV, ITMO University, St. Petersburg, Russia, MARIA DEMIDOVA, Wright State University, Dayton, OH, ANATOLY KUDRYAVTSEV, St. Petersburg State University, St. Petersburg, Russia — The main objective of this work was to construct a numerical model of corona discharge in helium at atmospheric pressure. Calculations were based on the two-dimensional hybrid model. Two different plasma-chemical models were considered. Models were built for RF corona and negative DC corona discharges. The system of equations was solved by the finite element method in the COMSOL Multiphysics. Main parameters of the discharge (the density of charged and excited particles and the electron temperature) and their dependence on the input parameters of the model (geometry, electrode voltage and power) were calculated. The calculations showed that the shape of the electron distribution near the electrode depends on the discharge power. The neutral gas heating data obtained will allow for the prediction of the temperature of the gases in atmospheric pressure helium plasma sources.

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Maria Demidova
Wright State University, Dayton, OH

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