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Influence of dielectric materials on radial uniformity in non-equilibrium atmospheric pressure helium plasma[1] AKINORI ODA, Faculty of Engineering, Chiba Institute of Technology, KYOHEI KOMORI, Graduate School of Engineering, Chiba Institute of Technology — Non-equilibrium atmospheric pressure plasma has been utilized for various technological applications such as surface treatment, materials processing, bio-medical and bio-logical applications. For optimum control of the plasma for the above applications, numerous experimental and theoretical investigations on the plasma have been reported. Especially, controlling radial uniformity of the plasma are very important for utilizing materials processing. In this paper, an axially-symmetric three-dimensional fluid model, which is composed of the continuity equation for charged and neutral species, the Poisson equation, and the energy conservation equation for electrons, of non-equilibrium atmospheric pressure helium plasma has been developed. Then, influence of dielectric properties (e.g. relative permittivity, secondary electron emission coefficient, etc.) of dielectric materials on radial plasma uniformity (i.e. radial distributions of electron density, ion density, electric field in the plasma) was examined.

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