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Numerical simulation of low-temperature helium plasma source for biomedical applications[1] VLADIMIR BEKASOV, ROMAN ZAMCHY, ANATOLY KUDRYAVTSEV, St. Petersburg State University — Numerical simulation of low-temperature helium plasma for biomedical applications was conducted. The plasma source is presented as a rod electrode located above the grounded plate. Helium acts as a working gas, which is supplied to the discharge through a quartz tube surrounding the rod electrode. An AC voltage with a frequency of 13 kHz and amplitude of up to 3 kV is applied to the electrode. Distance between rod tip and plate varies from 1 to 8 centimeters. Helium blow rate is considered in the range from 1 to 10 m / s. For a description of the discharge, in this paper, two-dimensional extended fluid model was presented. It consists of the continuity equations for calculating the concentration of particles, the energy balance equation for finding the electron temperature and the Poisson equation for electric fields. To calculate the velocity of neutral particles Navier-Stokes equations was solved, and thermal conductivity equation was solved for calculating the heating of the neutral gas.

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