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Plasma Sheath Properties at Gas-Dielectric Interface ASHRAF FARAHAT, King Fahd University of Petroleum & Minerals — Microdischarges have numerous properties that have been investigated in a number of applications including microdischargers for small spacecraft and plasma displays. A two dimensional flowing gas-plasma model is developed to investigate microdischarges properties near dielectric surfaces. The model consists of electrons, ions and metastable species conservation equations and the Poisson equation and is applied to a 1.2 mm length, 0.2 mm height argon filled microdischarger including anodes and a cathode separated by a dielectric material. Initial electron swarm is assumed to be uniform in the volume and equal to 10^8 m^{-3}. Secondary emission due to ions and excited particles impact is considered with a coefficient equal to 0.05. We present early nanoseconds charge development near the dielectric surface and at the electrodes – dielectric boundaries. Two-dimensional plots of the charged and excited-species densities are presented and discussed. Electrons' temperature reaches 11.7 eV after 580 ns. Positive dielectric surface charges results in an anode virtual expansion which help in the formation of an ion sheath that gradually decreases the potential gradient between electrodes.

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