Numerical study of the dynamics of a surface barrier discharge in nitrogen

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A model of a surface dielectric barrier discharge in nitrogen is formulated in this work. The model is based on the continuity equations for charged, excited, and neutral particles, the Poisson equation for a self-consistent electric field., The equalization of the energy balance for the heavy plasma component and the vibrational temperature of nitrogen, as well as the Navier-Stokes system of equations for describing gas-dynamic effects in the discharge formation zone. In this work, numerical experiments are carried out for nanosecond barrier discharges. The parameters of the plasma in the active phase of the discharge and in the afterglow phase are determined. The influence of the "memory effect" during the formation of the discharge in the second pulse is determined.