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UNIFORM OF PULSE BARRIER DISCHARGE IN THE AIR OF ATMOSPHERIC PRESSURE IN THE PRESENCE OF WATER IN A DROP-FILM CONDITION

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Abstract

It was shown the possibility of creating in atmospheric air in a plane-parallel gap in the presence of water with a drop-film state of a uniform pulsed barrier discharge, which was initiated by unipolar voltage pulses of amplitudes up to 28 kV and fronts 40 ns and duration about 100ns. Studies were carried out at thicknesses: the dielectric barrier is 2 mm and the gas gap 3 mm. The characteristic dimensions of tap water drops were 1 mm and its films on the walls of the gas gap ~ 0.1 mm. For these conditions, the following amplitude discharge parameters were achieved: the electric field strength in the gas gap was about 60 kV/ cm, the current density –2.6 A/cm^2, the electron concentration – 8.5·10^{11} cm^{-3} with their average energy – 3,7 eB. The discharge becomes non-uniform: zones with bright filamentary formations appear in the gas gap when increasing of the frequency of repetition of voltage pulses over 300 Hz,. The limiting frequency of the discharge transition into an inhomogeneous form becomes significantly higher (more than 500 Hz) with transverse purging of the gas gap with air, the speed of which at the

entrance to the electrode system is 0.6 m/s.
References 12, figures 7.

Key words: uniform and non-uniform pulsed barrier discharge, air, atmospheric pressure, drops and a film of water.

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