Abstract Submitted
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Investigation of atmospheric pressure glow microdischarge between flat cathode and needle anode in helium and argon.[1] ALEXANDER ASTAFIEV, VLADIMIR BELYAEV, ROMAN ZAMCHII, ANATOLY KUDRYAVTSEV, OLGA STEPANOVA, Saint Petersburg State University, St. Petersburg, Russia, ZHAOQUAN CHEN, Anhui University of Science and Technology, Huainan, China — DC atmospheric-pressure glow microdischarge was generated between a flat cathode and needle anode with a diameter of 100 μm in a special chamber with helium or argon. Dependences of discharge parameters on an interelectrode gap was investigated with an original experimental setup based on a movable arm on the hinge joint which allowed changing the gap with a step of 5 μm. The gap was varied from 5 to 700 μm. Discharge current was 1-21 mA. Such discharge cell has a very low interelectrode capacitance and provides increasing the stability of the discharge against arc formation (transition to RC oscillations mode) at low currents of 1 mA. A weak dependence of discharge voltage across the gap was revealed in helium at 100-250 μm between the electrodes (normal discharge). In contrast to this, glow microdischarge in argon has a descending current-voltage characteristic and unstable nature. The discharge voltage depending on the gap changes significantly slower than in helium. According to our estimations, the strength of electrical field of positive glow in argon is 5 times lower than in helium.

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