

Abstract Submitted
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On electric field magnitude on the cathode surface in the negative corona discharge¹ A. PETROV, S. SAVINOV, P.N. Lebedev Physical institute of RAS, N. PESTOVSKII, E. KOROSTYLEV, Moscow institute of physics and technology, R. AMIROV, I. SAMOYLOV, Joint institute for high temperatures of RAS, S. BARENGOLTS, A.M. Prokhorov General physics institute of RAS — Negative corona discharge has been studied in air in the Trichel pulse mode in point-to-plane configuration on graphite cathodes. Electric field magnitude of the positive space charge in the active phase of a Trichel pulse has been estimated on the range of 10^7 V/cm. The discharge flame on the cathode surface is localized in the region with maximum electric field [1]. The wandering of the discharge is self-organized in such way that the electric field magnitude caused by the positive space charge in the region of the discharge flame localization exceeds the field magnitude on the microasperities in some distance from this region. So the proposed estimate of electric field magnitude is based on the results of the topography analysis of the cathode surface and on the results of registration of the discharge wandering over the cathode surface. Microasperities formed due to redeposition of erosion products with field magnification coefficient $10\text{-}10^2$ were found. Finally the occurrence of electric field with magnitude 10^8 V/cm argues in favor of electroexplosive mechanism of cathode erosion in the negative corona discharge. [1] Loeb, L.B. Electrical Coronas. Their Basic Physical Mechanisms. Berkeley, CA: Univ. California Press, 1965, 694 p.

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