Abstract Submitted
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Runaway Electron Preionized Diffuse Discharge and Its Impact on Plane Anode.[1] VICTOR TARASENKO, Head of laboratory, MICHAEL EROFEEV, researcher, VASILII RIPENKO, post-doctor, MIKHAIL SHULEPOV, junior researcher, EVGENII BAKSHT, senior researcher, NATIONAL RESEARCH TOMSK POLYTECHNIC UNIVERSITY COLLABORATION[2], INSTITUTE OF HIGH CURRENT ELECTRONICS COLLABORATION[3] — The spatial structure of a runaway electrons preionized diffuse discharge (REP DD) in nonuniform electric field and the influence of its plasma on the surface of a plane anode have been studied. In our experiments, we used a NPG-18/3500N high-voltage generator. The incident voltage had negative polarity, amplitude of ˜20 kV, and FWHM of 6 ns; the discharge current was up to 200 A. The discharge plasma was formed in nitrogen by applying high voltage pulses to the interelectrode gap which was varied between 2 and 9 mm. Under such conditions, the specific input power reached up to 10 MW/cm^3. It is established that diffuse channel is the initial stage of the discharge radiation; then anode spot, channel with high glow intensity based on the anode spot and spark channel are consecutively formed. Spark formation finished within 10–15 ns after the onset of the discharge. Microstructure of spark and diffuse channels with anode spot autograph have been detected. The traces of such discharge represents itself an aggregation of up to 100 microcraters with dimeters of 5–100 micrometers. It was also shown that diffuse discharge does not leave erosive action on an anode surface or on its carbon cover.

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