Abstract Submitted
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Parameters of Runaway Electron Beams at a Subnanosecond Breakdown of Gases at Atmospheric Pressure[1] VICTOR TARASENKO, Head of laboratory, INSTITUTE OF HIGH CURRENT ELECTRONICS COLLABORATION, NATIONAL RESEARCH TOMSK POLYTECHNIC UNIVERSITY COLLABORATION — The generation of runaway electrons in gases at atmospheric pressure is a fundamental physical phenomenon. The aim of this work is to determine the main parameters of runaway electron beams at a subnanosecond breakdown of gases at atmospheric pressure from experiments performed with the highest currently achieved time resolution. Studies were performed with five experimental setups and three generators of nanosecond pulses with the duration of the voltage pulse front from 0.1 to 1 ns and the amplitude of the voltage pulse in the incident wave from 40 to 200 kV. It has been proven that the duration of the current pulse of the runaway electron beam detected behind the foil of the gas diode in air and other gases at atmospheric pressure was ˜100 ps. It has been shown that the use of a collimator with a hole with a diameter of 1 mm or smaller, short interelectrode gaps, and cathodes with a small area of a sharp edge makes it possible to separate a fraction of runaway electrons of the beam and to detect pulses with a FWHM of about 25 ps. The number of electrons detected behind the anode foil was correspond to a current amplitude of the runaway electron beam of 100 A.

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