

Abstract Submitted
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Current-Voltage Characteristic of Nanosecond - Duration Relativistic Electron Beam ANDREY ANDREEV, MIKHAIL FUKS, EDL SCHAMILOGLU, University of New Mexico — The pulsed electron-beam accelerator SINUS-6 was used to measure current-voltage characteristic of nanosecond-duration thin annular relativistic electron beam accelerated in vacuum along axis of a smooth uniform metal tube immersed into strong axial magnetic field. Results of these measurements as well as results of computer simulations performed using 3D MAGIC code show that the electron-beam current dependence on the accelerating voltage at the front of the nanosecond-duration pulse is different from the analogical dependence at the flat part of the pulse. In the steady-state (flat) part of the pulse, the measured electron-beam current is close to Fedosov current [1], which is governed by the conservation law of an electron moment flow for any constant voltage. In the non steady-state part (front) of the pulse, the electron-beam current is higher than the appropriate, for a given voltage, steady-state (Fedosov) current.

[1] A. I. Fedosov, E. A. Litvinov, S. Ya. Belomytsev, and S. P. Bugaev, “Characteristics of electron beam formed in diodes with magnetic insulation,” *Soviet Physics Journal (A translation of Izvestiya VUZ. Fizika)*, vol. 20, no. 10, October 1977 (April 20, 1978), pp.1367-1368.

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