# INVESTIGATION OF THE EFFECT OF IONIZING RADIATION ON THE CHARACTERISTICS OF RESISTIVE SWITCHING OF $ZrO_2(Y_2O_3)$-BASED MEMRISTIVE DEVICES AS PART OF THE 1T1M CROSS-BAR ARRAY

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In the near future, the qualitative development of electronics is associated with the research and development of devices containing memristive elements capable of changing their resistive state depending on the applied voltage and maintaining it for a long time. Research of memristors under the influence of ionizing radiation is a relevant task due to the possibility of developing radiation-resistant electrical products for their use in devices operated in conditions of increased radiation background, for example in the space or nuclear industry.

The paper presents a software-hardware system (SHS) developed on the basis of National Instruments and the LabVIEW platform, which allows studying the parameters of resistive switching (RS) of memristive devices. The results of a study of CMOS-integrated $ZrO_2(Y_2O_3)$-based memristive structures, which are part of a 32 × 8 array in a cross-bar architecture, using the developed SHS, are presented. The choice of $ZrO_2(Y)$-based memristive devices is justified by their high endurance to multiple RS (at least $3 \cdot 10^6$ cycles).

The paper also presents the results of a study of the effects of ionizing radiation on the RS parameters of these memristive devices, performed using the developed SHS and the electron accelerator LU-10-20. It is found that the memristive devices $ZrO_2(Y_2O_3)$-based remain functional after exposure to braking radiation with a total exposure dose of at least 3.4 MR without significant changes in the parameters of the RS.

The research was carried out within the framework of the scientific program of the National Center for Physics and Mathematics, direction No. 9 «Artificial intelligence and big data in technical, industrial, natural and social systems». Memristive devices were fabricated at the Laboratory of Memristor Nanoelectronics of UNN (state assignment No. FSWR-2025-0006).