

MEASUREMENT OF THE ELECTRON SPECTRUM BASED ON CHERENKOV RADIATION IN THIN DIAMOND CRYSTALS

K.P. ARTYOMOV^{1,2}, V.S. RIPENKO¹, M.A. SHULEPOV¹, A.G. BURACHENKO¹

¹*Institute of High Current Electronics SB RAS, Tomsk, Russia*

²*Tomsk Polytechnic University, Tomsk, Russia*

Nowadays, the great attention is paid to the use of small and ultra-small artificial satellites (CubeSat) for the study of near-Earth space. In particular, they are used to monitor the flows of charged particles captured by the Earth's magnetic field. The dimensions of the CubeSat impose a restriction on the scientific equipment placed in them. We investigated the possibility of creating a compact electron spectrometer based on the Vavilov-Cherenkov effect, in which a thin diamond crystal is used as a radiator.

The efficiency of Vavilov-Cherenkov radiation (VCR) generation in a diamond crystal for electrons in the energy range 0.06–2 MeV we estimated using the numerical simulation. The experimental scheme with the maximum detection efficiency of VCR is proposed. The performed experimental measurements are in good agreement with numerical calculations.