

THE OPTIMIZED NUCLEAR MICROPROBE WITH AN EXTERNAL PROTON BEAM

S. O. Lebed, O. G. Kukharenko, O. O. Veselov, J. Lekki, Z. Stachura

On the basis of numerical simulation, using the SRIM program and author's programs (INITBEAM, DEGRADBEAM), close optimal structure and geometrical parameters of an exit device of the nuclear microprobe (NMP) with the external beam of ions are determined. Thin films-windows (*Si₃N₄*, *Mylar*, *Kapton* or *Al*) of thickness of 0,2 - 10 microns are used in the exit device. The obtained results allow carrying out the optimized choice of geometrical parameters of the device and films-windows to pass to atmosphere (normal conditions) high energy (2,5 MeV) proton microbeam with the purpose to achieve the minimal degradation of the main ion-optical parameters of the probe on the sample surface. Calculations were used to develop design of the exit device, specialized for a precision irradiation of microscopic samples (living cells) by single ions, of Cracow NMP with the external beam of ions. Some features of this device are discussed in article.