A NEW INTEGRATED DESIGN FOR A COMPACT NUCLEAR PROBE

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An integrated design and main ion-optical parameters for the new compact scanning nuclear probe with external proton beam (or helium ions) based on a modified 3 MV ultra stable single ended electrostatic accelerator and optimized short (3,25 m) probe forming system are demonstrated. The system is used the micro slits and divided triplet of magnetic quadrupole lenses. The results of the optimized ion-optical calculation for the accelerating and probe forming systems are obtained using the programs: SIMION, TRANSPORT, PRAM та OXRAY. These results are planning to be used for the design of a new vertical nuclear probe with an external ion beam. The probe will permit the application of the novel medicine and biological investigations with living cells under normal conditions. It is shown that developed design has a great promise for the next generation of the nuclear probe equipped with a high brightness gas field ion source. The probe will allow the elemental distribution studies in a sample by PIXE technique to be carried out with a spatial resolution of about 0,1 μm.