

THE NEW SHORT PROBE-FORMING SYSTEM FOR A SCANNING NUCLEAR NANOPROBE

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The paper describes an optimized short (total length of 2,25 m) probe-forming system that uses the divided Russian quadruplet of magnetic quadrupole lenses to focus a 3 MeV proton beam. The system permits to create an ion beam spot size $<1\mu\text{m}$ at the probe target in the high current mode with large (0,3 – 1 %) parasitic (sextupole and octupole) pole tip field contamination in the lenses. The optimizing calculations include dominant intrinsic and parasitic lens aberrations. The advantages and shortcomings of the alternative PFSs are shown. The results obtained in the numerical simulation are expected to be used in designing a vertical nuclear nanoprobe with an external ion beam.