

Ion Beam Focusing by Plasma Gun, V. BELAN,
V. BUTENKO, B. IVANOV, V. KISELEV,
A. KITSENKO, A. LINNIK, V. MASLOV,
V. OGNIVENKO, I. ONISHCHENKO,
V. PRISHCHEPOV, A. YEGOROV, Kharkov Inst. of
Physics & Technology - The theoretic and experimental
investigations of the ion beam focusing dynamics
represented. Proton beam (5 MeV, 30 mA, 30 ms)
produced by RFQ-accelerator 'Ural-5^a in NSC KIPT was
injected into plasma flow, generated by coaxial plasma gun.
Plasma of density $10^{12} \times 10^{15} \text{ cm}^{-3}$ had the temperature
3 eV, and time duration 150 ms. The measurements have
shown that focusing effect was caused by several factors:
azimuth magnetic field of the current in plasma, polarization
electric field, originating when plasma flow collides with
the magnetic barrier and due to space charge compensation.
Finally the transverse sizes of the proton beam became
6 times less at the distance 40 cm. Several physical
mechanisms were considered theoretically and by using
numerical calculation.

Work supported by STCU Grant # 298.