

COLLECTIVE ACCELERATION OF LIGHT IONS IN A PLASMA FILLED DIODE WITH A POINTED CATHODE

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The results of the collective acceleration of light ions, protons and deuterons, in the Plutto / Luce diode system are presented [1-2]. The diode system is a pointed cathode and an anode plate with a central hole in the region of which a plasma cloud is formed due to the ionization by a pulsed electron beam of gas preliminarily injected into the anode region after the gas valve has been actuated. The minimum valve response time has been achieved as low as 20 μ s. The gas concentration was controlled by the delay time of the accelerator operation with respect to the valve opening time. We also used a 2-pulse generator operation mode, in which it was the first high-voltage nanosecond voltage pulse that provided gas ionization. The diode current was 20 kA at the pulse duration of 60 ns at an accelerating voltage of up to 400 kV. The dependences of the efficiency of acceleration of light ions on the gas density and, accordingly, the plasma density in the region of the diode system, the size of the diode gap are obtained. The parameters of the ion beam were determined using electrophysical and nuclear-physical methods of analysis [3].

REFERENCES

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