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Characteristics of a Heavy Ion Injector z/A $1/3$ based on Laser-Plasma Ion Source

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Design of the high-current ion injector for ions with z/A $1/3$ is described. The system consists of a laser-plasma generator based on a repetition rate CO_2 laser, a vacuum target chamber with optical focusing system, a beam extraction and transport system, and RFQ accelerator with z/A $1/3$. The goal of the work is to optimize parameters of all of the above components for maximum ion beam current at the output. Carbon ion energy spectra of CO_2 laser produced plasma at radiation power density of $8 \cdot 10^{11} W/cm^2$ were studied. Conditions for generating $C^{4+} \div C^{6+}$ ions in the vacuum chamber in use were found. The C^{4+} ion beam produced by the source was matched into the RFQ and measurements of its emittance and current are being performed.

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