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Efficient injection of high-intensity light ions from an ECR ion source into an RFQ accelerator

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This study investigates an efficient injection of high-intensity light ions from an Electron Cyclotron Resonance (ECR) ion source into a Radio Frequency Quadrupole (RFQ) accelerator. An often-adopted solution for the beam matching between an ion source and an RFQ is to apply two solenoids as a Low Energy Beam Transport (LEBT) section. There are also other solutions which skip the LEBT section and inject the ion-source output beam directly into an RFQ e.g. the so-called Direct Plasma Injection Scheme (DPIS). For this study, a compact electrostatic LEBT using an einzel lens as well as an efficient RFQ based on a special design method have been developed to achieve high transmission of a 60 mA proton beam. Additionally, the RFQ design has been also checked with the LEBT removed. The design and simulation results will be presented.

Footnotes

Funding Agency

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Yes

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