

Simulation Study of the Low Energy Beam Transport with Einzel Lens

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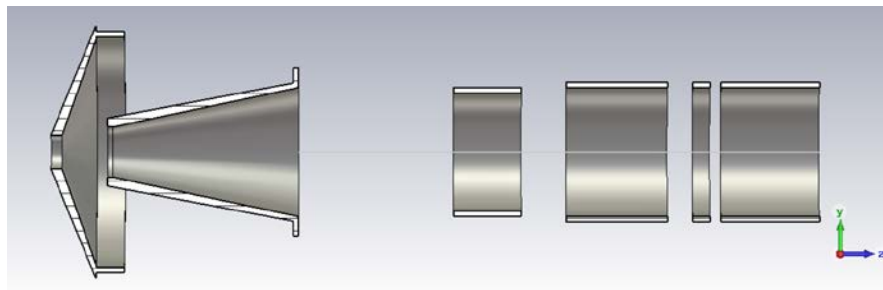
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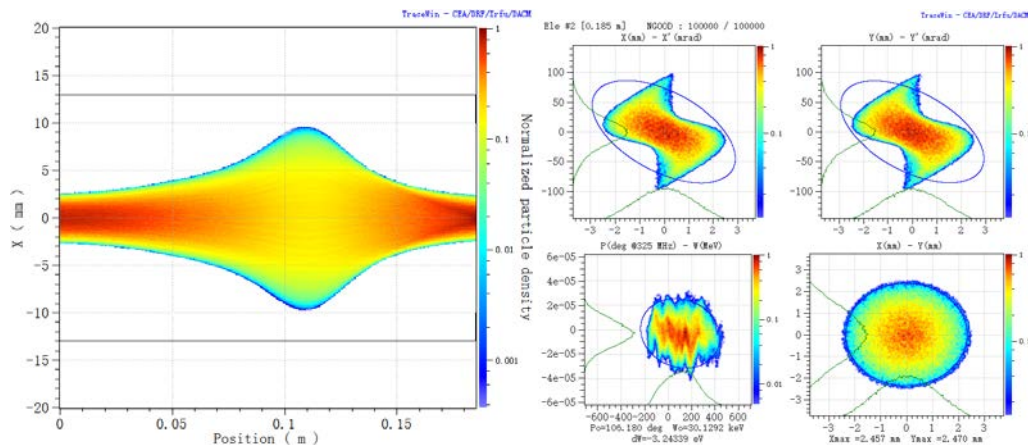
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Einzel Lenses are frequently used in low energy beam transport[1]. We design a triple electrostatic lenses in order to transport H⁺ beam with 30keV energy and 10mA current between ion source and RFQ. The purpose is to focus the beam and match the RFQ. Einzel Lens has the advantages of cheap, compact, easy to machining and operate. The total length of low energy transport system is about 185mm.

Finite element software CST and PIC program TraceWin are used to simulate the low energy system transport. In the simulation process, we change the electrode shape, gap and electrode voltage to study the influence on beam transport. Finding some regular conclusion for the future design.



Einzel Lenses modeling by CST



Low energy beam transport density

Phase diagram of Einzel Lenses outlet

Reference

- [1] T. Kobayashi, S. Ikeda, Y. Otake, Y. Ikeda, and N. Hayashizaki, "Completion of a new accelerator-driven compact neutron source prototype RANS-II for on-site use," *Nucl. Instruments Methods Phys. Res. Sect. A Accel. Spectrometers, Detect. Assoc. Equip.*, vol. 994, no. October 2020, p. 165091, 2021, doi: 10.1016/j.nima.2021.165091.