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Beam dynamics design of a Superconducting RFQ for CiADS

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A superconducting radio-frequency quadrupole (SRFQ) is proposed for the future upgrade of the China Initiative Accelerator Driven System (CiADS). The SRFQ is de-signed to accelerate a 10 mA proton beam to 2.5 MeV within a compact length of 2.9 m. This design achieves 100% transmission efficiency and a carefully controlled output longitudinal emittance, ensuring minimal beam loss in the superconducting cavities. This paper presents the detailed beam dynamics design and its simulated performance.

Footnotes

Funding Agency

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