

Physical design of the injector for XiPAF-upgrading

Sunday 25 August 2024 16:00 (2 hours)

This paper describes the physical design of one linac injector for the proton/heavy ion synchrotron, which is under construction for Xi'an 200 MeV Proton Application Facility(XiPAF) heavy ion upgrading project. A heavy ion linac injector will be constructed close to the existing proton linac injector. The heavy ion injector consists of one electron cyclotron resonance(ECR) source, one low energy beam transport(LEBT) section, one radio frequency quadrupole(RFQ) accelerator, one interdigital H-type drift tube linac(IH-DTL), and one linac to ring beam transport(LRBT) section. Heavy ion beams will be accelerated to 2 MeV/u. The unnormalized 99%-particles emittances at the injection point of proton and heavy ion are optimized to be lower than 10 and 16 $\mu\text{m}\cdot\text{mrad}$, respectively. Besides, low dispersion at the injection point is obtained to minimize the beam offset caused by the dispersion mismatch in the synchrotron. Three scrapers are installed in the LRBT to meet the requirement of emittance and dispersion.

Footnotes

Funding Agency

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Session Classification: Student Poster Session

Track Classification: MC3: Proton and Ion Accelerators and Applications: MC3.2 Ion linac projects