Contribution ID: **167** Contribution code: **THPT07** Type: **Poster Presentation**

Beam dynamics design of the superconductiong section of a 100 mA superconducting linac

Thursday, October 23, 2025 5:10 PM (20 minutes)

Beam loss is a critical challenge in the physics design of high power superconducting proton linacs. The challenge is even more acute in linacs that feature high peak intensity and low energy, which has strong space charge effect and RF nonlinear force. In this paper, we study how to achieve a high transmission rate for beam halo particles, commonly a major source of beam loss, via beam halo matching and acceptance optimization. We employ this method of beam loss reduction to improve the physics design of a high power 100 mA superconducting linac which has potential applications in high brightness neutron production.

Footnotes

Funding Agency

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Yes

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Session Classification: THPT poster session

Track Classification: WGB:Beam Dynamics in Linacs