

CW copper injector for SRF industrial cryomodules

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Compact SRF industrial linacs can provide unique parameters of the beam (>1 MW and >1-10 MeV) hardly achievable by normal conducting linacs within limited space. SRF technology was prohibitively expensive until the development of conduction cooling which opened the way for compact stand alone SRF systems suitable for industrial and research applications. Limited cooling capacity puts strict requirements on the beam parameters with zero losses of the beam on the SRF cavity walls. This implies strict requirements on the beam energy to be accepted by the cryomodule and most importantly the beam bunching with zero particles in between.

We designed a CW normal conducting RF injector which consists of a gridded RF gun integrated with a first cell of a copper booster cavity to satisfy these requirements. Here we present a complete design of a booster cavity including beam dynamics, RF, thermomechanical and engineering design.

Footnotes

Funding Agency

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