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Design of a 915 MHz conduction-cooled cryomodule

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High-power, compact, continuous-wave (CW) linear electron accelerators with beam energies of up to 10 MeV are being considered for possible industrial applications. Conduction-cooled, superconducting radio-frequency (SRF) technology allows operating such machines at high electrical efficiency, thereby reducing the operating cost significantly. A prototype conduction-cooled SRF cryomodule has been designed and components are currently being manufactured. The cryomodule features a two-cell, 915 MHz SRF cavity, two cryocoolers, a fundamental power coupler, two magnetic shields, a thermal shield and warm-to-cold transitions. The cryomodule has been designed to be able to provide an energy gain of 3.5 MeV to a CW electron beam with a current of 5 mA. This contribution focusses on thermal and mechanical design aspects of the cryomodule.

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Yes

Footnotes

Funding Agency

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