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Beam Dynamic study of the accelerating cavity of the dual energy NSTRI-eLinac

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The side-coupled standing wave accelerator tubes have a wide range of applications in linear electron accelerators due to their relatively high acceleration gradient and relatively low sensitivity to manufacturing errors. In the NSTRI-eLinac project, a dual energy electron linear accelerator is defined for cargo applications. In this accelerator, a side-coupled standing wave tube accelerates electrons to energies of 4 and 6 MeV. This tube operates at a frequency of 2998.5 MHz in the $\pi/2$ mode, fed by a magnetron with a maximum power of 2.6 MW. The most important issue in designing the accelerating tube is the interaction between the electron beam and the RF electromagnetic field to deliver the electron bunch at the desired energy with maximum efficiency and suitable output beam quality. Beam dynamics studies are essential for determining the specifications of the output beam. In this paper, the output beam characteristics for the NSTRI accelerating tube have been investigated using the STRA code. The results estimate the output beam characteristics in energies of 4 and 6 MeV at the end of the constructed tube.

Footnotes

Paper preparation format

Region represented

Asia

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