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Design of a compact electron linac for the X-ray based intraoperative radiotherapy

Tuesday 3 June 2025 16:00 (2 hours)

In order to fill the gap of X-ray intraoperative radiotherapy technology in China, an X-band standing wave electron linear accelerator with operating frequency of 9.3 GHz was designed for X-ray intraoperative radiotherapy equipment. Using electromagnetic simulation software and beam dynamics simulation software, the outlet energy of the accelerator is 50 keV , and the electron capture efficiency is 37.5 %. The first cavity is 10 mm long for the optimization of the electron beam energy spectrum, and the second cavity is 12 mm long for the electron beam acceleration. The microwave power is distributed to the two cavities respectively through the power divider and the coupler. There is no energy exchange between the two cavities.

Footnotes

Keywords: Intraoperative Radiotherapy, X-band, Standing wave, Accelerator

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