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Design of IH-DTL with PMQ focusing for medical RI production

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In recent years, plans for cancer treatment using medical RI have been progressing worldwide. The stable supply is difficult due to the aging of small nuclear reactors and dependence on imports from abroad. Manufacturing using accelerators could realize a stable supply in Japan. To give an example of Astatine-211, the production of an alpha-ray drug requires helium nuclei of 7 MeV/u or more. This time, we are designing an accelerator system with the aim of accelerating helium ions with a peak current value of 30mA and a duty cycle of 5%. As an accelerator following the radio-frequency quadrupole linac (RFQ), which accelerates up to 0.6 MeV/u, we are considering the design of an interdigital H-mode drift tube linac (IH-DTL) with permanent magnet quadrupoles (PMQ) in the drift tubes. This accelerator is designed to operate at 200 MHz to use the commercially available semiconductor power supply for saving space and electricity and improving maintainability. In this presentation, we report on the basic design of the IH-DTL with PMQ.

Footnotes

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Asia

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