

Performance study of high heating power magnetron through special combination of a solid-state pulse modulator and an external heating power supply

Thursday, November 14, 2024 1:00 PM (1h 30m)

At the Research Center of Dongnam Institute of Radiological & Medical Sciences (DIRAMS), C-band LINACs have been developed and operated. A C-band magnetron with 45 kV and 80 A will be used in the next DIRAMS LINAC, and it requires the standalone test before integration. For quality control and quality assurance, a C-band magnetron test bench has been designed and built, consisting of a magnetron (5712 ± 10 MHz), a directional loop-coupler, a 4-port circulator, three dummy loads, a rotary joint, RF waveguides, a water-cooling system, a high-voltage pulse modulator (50 kV, 120 A), a high-power heating system (570 VA), a control and monitoring system etc. However, since the heating power of this magnetron is approximately three times higher than the existing one (200 VA), an external heating power supply providing 570 VA was specially designed and implemented to operate in conjunction with the solid-state pulse modulator. The solid-state pulse modulator with the external heating power system was tested with the resistive load systems. The magnetron test was completed on the test bench and performance were verified using a spectrum analyzer. (This work was supported by the Dongnam Institute of Radiological & Medical Sciences (DIRAMS) grant funded by the Korea government (MSIT). (No. 50493-2024))

Paper submission Plan

Yes

Best Presentation

Yes

Contribution track

ICABU WG1. Accelerator Systems

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Session Classification: ICABU Poster Session

Track Classification: ICABU: ICABU WG1. Accelerator Systems