



Contribution ID : 26

Type : **Talk (remote)**

Ultra-high dose rate X-ray radiator for studying flash radiotherapy

Wednesday, 12 April 2023 15:00 (20)

Ultra-high-dose-rate (UHDR) radiation is considered to trigger the so-called flash effect which spares the normal tissue while retains the therapeutic effect on tumor. X-ray is the least explored modality compared to electron or proton. The main challenge is to have electron accelerator achieving both high power and fast response. We introduce a compact radiator using a 10-MeV, backward travelling wave linac. This radiator generated X-rays with dose rate of 80 Gy/s at the SSD of 50 cm. It worked stably with the dose fluctuation less than 1%.

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Session Classification : Room 1 (Laby Theatre)

Track Classification : WG3: Accelerator technologies for industrial & medical applications