Contribution ID: **2736** Contribution code: **TUPM135** Type: **Poster Presentation**

Development of an ultrahigh dose rate radiation platform for X-ray FLASH radiotherapy research

Tuesday, 9 May 2023 16:30 (2 hours)

An ultrahigh dose rate (UHDR) MV-level X-ray radiation platform for FLASH radiotherapy (RT) research based on a normal conducting linear accelerator is presented in this work. A S-band backward traveling-wave linear accelerator powered by a commercial klystron produces electron beams with 11 MeV energy, 300 mA pulse current, and 2.6 mA mean current at 0.88% beam duty ratio. The radiation platform generates X-ray by bremsstrahlung. Flattening filters and collimators are included to produce a 4 cm × 3 cm field with flatted profile dose distribution. The measured dose rate was 129 Gy/s and the flatness was 14% after flattening. The UHDR X-ray platform now is used for FLASH preclinical animal research.

Funding Agency

Footnotes

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Yes

Primary authors: LIU, Focheng (Tsinghua University in Beijing); ZHANG, Liang (NUCTECH Company Limited); ZHANG, Xiaotong (NUCTECH Company Limited); GU, Weihang (Tsinghua University in Beijing); ZHA, Hao (Tsinghua University); SHI, Jiaru (Tsinghua University in Beijing); CHEN, Huaibi (Tsinghua University)

Presenter: LIU, Focheng (Tsinghua University in Beijing)

Session Classification: Tuesday Poster Session

Track Classification: MC4: Hadron Accelerators: MC4.A08: Linear Accelerators