with a 0.4 μm thick a-Si:H layer, was connected to a TetrAMM picoammeter working at 100 kHz. Acquisitions were conducted with 8 MeV conventional (CONV) electron and 10 MeV UHDRE beams. Measurements were performed at the isocenter (CONV-UHDRE) and 53 cm from the source (UHDRE), at the maximum depth, setting a 10×10 cm^2 field and varying the PRF. The device resolved distinct electron pulses, while maintaining stable signal characteristics in both CONV and UHDRE modes. At the isocenter, the dose per pulse was 0.5 mGy (CONV) and 0.63 Gy (UHDRE), increasing to 2.22 Gy (UHDRE) closer to the source. For example, the average pulse charges acquired with one pixel were 1.17 pC (CONV) and 2.163 nC (UHDRE), with amplitudes of 15.4 nA and 31.23 μA. At 53 cm from the source, UHDRE pulses registered 3.33 nC and 47.4 μA. The flexible a-Si:H detector exhibited strong potential for fast, real-time dosimetry in FLASH radiotherapy.

Development of a novel prototype and electronics for 2D dosimetric measurements with silicon carbide detectors for FLASH radiotherapy.

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The use of ultra-high dose rate (UHDR) beams (> 40 Gy/s) triggering the FLASH effect is gaining interest for its potential to expand the therapeutic window. However, commercial dosimeters often fail under these conditions due to saturation. The DALÌ (Development of Advanced Dosimetric Techniques for UHDR Beams) project, led by the University of Palermo in collaboration with INFN Catania Division and STLab, aims to design an innovative detection system based on a 2D matrix of silicon carbide (SiC) sensors optimized for QA in FLASH radiotherapy. The 64-channel prototype features custom electronics with high-speed ADC and a Raspberry Pi 4 for data acquisition. Dedicated software enables fast one-shot acquisitions, while a user-friendly interface supports real-time use and background correction. Simulations guided design choices and dose reconstruction via interpolation. The system is scalable beyond 500 channels, offering a cost-effective solution for next-generation dosimetry and reducing radiation protection issues typical of UHDR irradiations. This work is partially funded by the European Union Next Generation EU through Projects Mission 4 Component 2 Inv. 1.5 CUP B83C22003930001.

Study of tumor invasiveness by super resolution fluorescence microscopy in cells irradiated with FLASH and conventional radiotherapy.

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The effects of FLASH Radiotherapy (FLASH RT) on tumor invasiveness remain poorly understood, particularly at the molecular level of cell adhesion. In this study, murine and rabbit-derived tumor cell lines were irradiated using FLASH RT (≥ 40 Gy/s) and Conventional Radiotherapy (CONV RT) (~ 2 Gy/min). Cells were fixed and labeled with fluorophore-conjugated antibodies targeting N-Cadherin and Integrin $\alpha_v\beta_3$, then imaged using STORM super resolution fluorescence microscopy. Structural changes in the distribution,