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FlashDC project: development of a beam monitor for Flash radiotherapy

FLASH radiotherapy brings severe challenges to dosimetry, beam control, and treatment verification. FLASH beam monitors able to measure the rate of impinging particles per pulse are crucial to validate and understand the FLASH effect. The simultaneous request of spatial modulation in dose delivery, high-dose average and instantaneous rates typical of FLASH ask for an accurate beam control that is non-trivial: dose-rate independence, wide dynamic range and specific spatial and temporal resolution are the needed requirements. Until now no technologies fully meet the requirements. The FlashDC project aims to develop an innovative beam monitor for FLASH, based on the physical phenomenon of air fluorescence. Using air as active medium in which fluorescence is developed allows to minimize the impact of the detector on the beam line and to have a device simple and cheap to produce. Fluorescence in air provides a signal unsaturated by the high number of particles per pulse with a very wide dynamic range (typical 10^{12} electron/pulse). Several prototypes of the beam monitors have been developed. Here we present a set of preliminary measurements together with the promising obtained results.

Primary experiment

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