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# Design and characterisation of a treatment monitoring system for carbon-ion radiotherapy based on 28 Timepix3 detectors

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Compared with conventional X-ray radiation therapy, carbon-ion beam radiotherapy reduces the dose to the healthy tissue around a tumor thanks to the escalating dose at the Bragg peak. We developed a tracking system for secondary radiation from carbon-ion beams based on seven modules of four Timepix3 detectors (“quad module”). The tracking system measures the secondary radiation of different treatment fractions delivered on consecutive days, and thus detects undesired treatment variations. In this contribution, the design and characterisation of the tracking system will be presented. The characterisation focused on the detection, localisation and identification of internal density changes in human head models. A clinical study focusing on monitoring the treatment of tumors of the head and neck region has been started.

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