

Medipix for dosimetry and beam characterisation in proton therapy facilities

Tuesday, 28 May 2024 08:44 (1 minute)

The Medipix3 is a hybrid pixel detector capable of individually counting protons with millisecond time resolution, even at clinical flux levels. With near-instant readout and count rate linearity, it proves to be suitable for dosimetry and beam characterization in proton therapy facilities. In this study, we present test results conducted at the Clatterbridge Cancer Centre (CCC) in the UK, a particle therapy facility specializing in treating ocular cancers using a 60 MeV passively scattered proton therapy beam. This marks the first evaluation of Medipix3 detector performance within a clinical setting with high proton flux. Beam profile measurements were carried out at various positions along the CCC beam line using both EBT3 Gafchromic film and Medipix3. EBT3, the current standard for conventional radiotherapy film dosimetry, served as a benchmark for validating the Medipix3 results. Count rate linearity and doses recorded with Medipix3 were assessed across the full range of available beam intensities. Furthermore, we discuss the potential applicability of Medipix3 for absolute proton therapy dosimetry. This research sheds light on the practical utility of Medipix3 in clinical proton therapy settings, offering insights into its performance and potential as a dosimetry tool.

Collaboration

Role of Submitter

I am the presenter

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Session Classification: Applications to Industrial and Societal Challenges - Poster session

Track Classification: T5 - Applications to Industrial and Societal Challenges