

Prompt Gamma Imaging in Particle Therapy



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Compton Imaging for Prompt Gamma Based Verification of Particle Therapy Beams

Friday, 7 July 2023 13:10 (1 hour)

The purpose of this talk is to review the development and use of Compton Imaging for the evaluation and verification of particle beams used for cancer treatment. First, the history of Compton Imaging and its initial applications in nuclear imaging and radiotherapy will be briefly reviewed. This will be followed by a discussion of applications of Compton cameras (CC) to image secondary prompt gammas (PG) emitted during particle therapy beam delivery for the purpose of verifying the position and range of the beam in vivo. This includes the capabilities for Compton cameras to produce 3-dimensional images and spectroscopic images of PGs emitted from elements of interest (e.g. oxygen) in healthy tissues and tumors. Finally, the barriers to clinical application of CCs for range verification will be discussed, as well as new frontiers in CC research that have the potential to overcome these barriers. The overall goal for this talk is to provide the viewer with an understanding of how CC based PG imaging works, as well as an introduction of emerging areas of research into their application in the radiotherapy treatment process.

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