

THE 21ST ASIA-OCEANIA CONGRESS OF MEDICAL PHYSICS

“Science for Radiation Medicine”

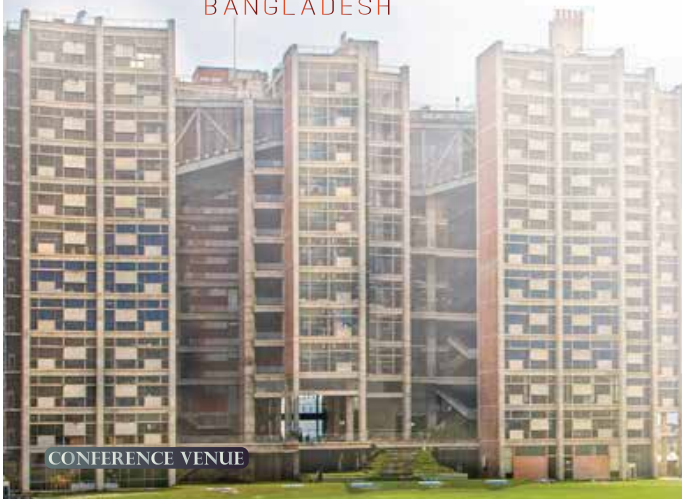
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VENUE

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DHAKA, BANGLADESH



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in the treatment room with minimum interference to the treatment process and without limiting the beam nozzle performance.

Conclusions: Prompt gamma-based imaging systems can potentially provide a real-time, in-vivo treatment monitoring method for proton therapy. The acquired data from the suggested slit-slat system was determined to be suitable for real-time range uncertainty monitoring. As a result, by integrating this information with a specified dose during the treatment process, the range and dose uncertainties in proton therapy can be revealed. Furthermore, using analytical or machine learning methods, the retrieved data may be beneficial for dose reconstruction.

PP-17

Optimizing Image Noise as a means to Improve Computed Tomography ATCM in Sri Lanka

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The use of automatic tube current modulation (ATCM) in CT scans has become widely popular over the past few years. This method significantly reduces patient dose by adapting the tube current during a CT scan to produce outputs with a specified target image quality throughout scans and across patients of varying sizes. Different scanners and ATCM programs modulate current using some of the following methods: angularly around the patient or based on an average attenuation along the z-axis; using a reference image and mA value or using provided noise reference levels. However, when misapplied, ATCM can subject a patient to excessive radiation doses or produce images of non-diagnostic quality. Thus, it is important to evaluate the impact different exposure parameters and other scan factors have on the image quality of CT scans across a patient population. This work evaluates image noise levels, a vital factor in judging image quality, of CT scans using ATCM taken at hospitals across Sri Lanka. Considering the default tube voltage of 120 kVp for chest and abdomen CT scans in Sri Lanka, except in very rare exceptions, a review of international papers studying various CT scan factors is included. These factors include exposure parameters such as tube potential (kVp), and pitch value, as well as patient centering. Using the evaluation of image noise levels, this work aims to establish a CT scan ATCM protocol for hospitals across Sri Lanka. International studies are used as context to establish a protocol that is highly specific to Sri Lankan patients while also considering the fact that higher noise values are tolerable for larger patients due to fat levels providing greater image contrast. The protocol will establish the CT scan factors that optimize image noise levels when ATCM is used on Sri Lankan patients.