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Monte Carlo dose calculations

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Monte Carlo dose calculations

Monte Carlo (MC) methods in radiation therapy have been increasingly important in the last two decades. MC-based dose calculation shifted from being considered a tool for a few to a widespread resource for daily use by medical physics and clinicians. This was the result of a continuous development and benchmarking of the models handling biophysical phenomena of radiation interaction within patients and the enormous speed-up of calculation times. The latter point was largely achieved via porting CPU-based MC codes to the GPU (Graphics Processing Unit). The lecture will focus initially on the fundamentals of the MC-dose calculations in radiation therapy emphasizing both the advantages and the limitations of MC dose engines. Clinical and research applications of MC codes will be presented together with the key elements for a successful GPU implementation of the MC.

Summary

Presenter: MAIRANI, Andrea (Universitaet Klinikum Heidelberg, UKHD.)