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Monte Carlo Simulations of LSO/YSO for Dose Evaluation in Photon Beam Radiotherapy

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Abstract : Monte Carlo (MC) techniques play a fundamental role in radiotherapy. A two non-water-equivalent of different media were used to evaluate the dose in water. For such purpose, Lu2SiO5 (LSO) and Y2SiO5 (YSO) orthosilicates scintillators are chosen for MC simulation using Penelope code. To get higher efficiency in dose calculation, variance reduction techniques are discussed. Overall results of this investigation ensured that the LSO/YSO bi-media a good combination to tackle over-response issue in dynamic photon radiotherapy.

Keywords : Lu2SiO5 (LSO) and Y2SiO5 (YSO) orthosilicates, Monte Carlo, correlated sampling, radiotherapy
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