

Deformable

Preliminary investigation and application of a novel deformable PRESAGE[®] dosimeter T Juang, J Newton, S Das, J Adamovics and M Oldham

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Deformable 3D dosimeters have potential applications in validating deformable dose mapping algorithms. This study evaluates a novel deformable PRESAGE[®] dosimeter and its application toward validating the deformable algorithm employed by VelocityAI. The deformable PRESAGE[®] dosimeter exhibited a linear dose response with a sensitivity of $0.0032 \Delta OD / (Gy/cm)$. Comparison of an experimental dosimeter irradiated with an MLC pencil beam checkerboard pattern under lateral compression up to 27% to a non-deformed control dosimeter irradiated with the same pattern verified dose tracking under deformation. CTs of the experimental dosimeter prior to and during compression were exported into VelocityAI and used to map an Eclipse dose distribution calculated on the compressed dosimeter to its original shape. A comparison between the VelocityAI dose distribution and the distribution from the dosimeter showed field displacements up to 7.3 mm and up to a 175% difference in field dimensions. These results highlight the need for validating deformable dose mapping algorithms to ensure patient safety and quality of care