3D dosimetry techniques are needed to measure complex dose distributions produced by conformal radiation therapy procedures. This requirement is fulfilled by the recently introduced BANG™ polymer gel dosimetry technique, which is based on radiation-induced polymerization of acrylic monomers in a rigid gel.[1] In the polymerized regions of the gel, both the water proton NMR relaxation rates and the optical absorbance increase linearly with the absorbed radiation dose. Stacks of MRI-derived 2D dose maps have been successfully used to reconstruct 3D dose distributions in the gel.[1] Also, optical laser CT scanning was recently proposed as a potentially more convenient and less expensive alternative means of measuring dose distributions in irradiated BANG™ polymer gels.[2,3] We have built a compact PC-based bench-top laser scanner for imaging BANG™ gels, and obtained very promising results in applications such as stereotactic radiosurgery.[4] In this presentation the optical measurements of dose distributions produced in BANG™ gels by typical megavoltage x-ray and electron fields are compared with conventional dosimetry data, and the current limitations and further developments of the optical CT/ BANG™ gel dosimetry are discussed.

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