

AbstractID: 1405 Title: Iterative reconstruction of brachytherapy seed configurations from x-ray projection images

If the true positions of brachytherapy seeds can be monitored intra-operatively, then the treatment plan can be adapted to provide an improved dose distribution. The positions of implanted brachytherapy seeds can in principle be completely determined by the information contained in three different images of the seeds in situ. In practice this problem is complicated by the large number of seeds, overlap among one or more seeds in the images, and variable image distortion between the viewpoints. We propose an iterative process that solves for the seed positions and the camera imaging characteristics simultaneously by creating simulated images from a test seed configuration and then iterating the test configuration until the simulated images match the real images. The basic concept has been demonstrated in simulation studies.