

AbstractID: 14549 Title: Treating a Moving Target Under the Guidance of Hybrid kV and MV Imaging

In recent years, MV and kV electronic flat panel imaging devices have become commonplace equipment installed on the gantry of many newer medical LINACs. Such imaging devices are now routinely used in the clinic for verification of correct initial patient setup before start of a treatment fraction. This is done through MV portal images, 2D kV fluoroscopic images, or cone-beam CT. However, these amorphous-silicon detectors have not been used to their full potential. With high resolution imaging capture rates of ~ 10 frames per second, the role of these MV and kV detectors can be additionally expanded to include real-time target tracking during the actual radiation treatment delivery process.

This lecture will provide an overview of recent research in the use of MV and kV imagers for real-time tracking purposes. In addition, an explanation of the basic theory and methods necessary to perform real-time tracking will be discussed.

Learning Objectives:

1. Fundamentals of MV and kV flat panel detectors.
2. Image processing and prediction methods used for real-time MV and kV tracking.
3. Issues involved in implementing hybrid MV and kV in the clinic.