Development of real-time motion verification system for respiratory-gated radiotherapy

Figure 1: A schematic representation for the real-time motion verification system (RMVS). The developed system consisted of two wall-mounted stereo-cameras and multiple IR markers on the patient’s anterior surface, and a phase synchronization program (PSP). The motion error calculator (MEC) was programmed to quantitatively compare acquired real-time images of the multiple IR markers with phase-matched reference images extracted from 4D-CT simulation data.

Figure 2: Experimental setup for system evaluation on a motion phantom.

Figure 3: Four markers attached on the phantom surface were tracked and compared with the 4D reference lines in real time.