

AbstractID: 11542 Title: LINAC Quality Assurance and Calibration using Electronic Portal Imaging Device

**Purpose:** Radiation treatment machine QA can be time consuming and oftentimes not accurate. The EPID on linacs can possibly be utilized for machine QA and calibration. In this study, we have developed methods to perform QA using EPID images. **Method and Materials:** A modified ball bearing phantom was constructed and set up according to the room laser center. Portal images were taken at different collimator, gantry, and table angles on an Elekta Synergy LINAC equipped with an *a*-Si EPID. Portal images of several jaw and MLC control points were taken also. All images were analyzed using custom developed software in Matlab to calculate collimator/table angle, collimator/table/gantry runout, and jaw/MLC positions. Multiple CBCT images were also taken to verify KV-MV coincidence and table correction accuracy. **Results:** Accurate quantitative results for mechanical, MLC, jaw and CBCT QA can be obtained using the developed method. **Conclusions:** We have developed automatic treatment machine QA methods using EPID images. This QA procedure is faster and more accurate than traditional QA methods.