

AbstractID: 1797 Title: An Automated Compensator Exchanger (ACE) for IMRT: seven-field, linear-exchange prototype

The use of physical compensators to deliver intensity-modulated radiation therapy (IMRT) offers some advantages over delivery via multileaf collimator alone. These advantages may include: superior spatial and fluence resolution, reduced treatment time, increased dose efficiency, faster and more reliable quality assurance (QA) per patient, less resources required for QA, and more reliable delivery. The main complaint typically leveled against using physical compensators for IMRT delivery is the requirement for an operator to manually exchange compensators between radiation beam deliveries. We are hoping to change that by developing an automated compensator exchanger (ACE). Over the last year, we have been designing and manufacturing a prototype device capable of holding seven compensators. The device automatically brings them in and out of treatment position, and is also able to register the physical position of each compensator. Controlling electronics have been designed and tested in-house by our nuclear electronics personnel. The metal frame and translational mechanics have been designed and fabricated in-house by our medical devices personnel. A graphical user interface has been developed to allow easy control of the device. Several feedback mechanisms have been incorporated to permit as safe a treatment delivery as possible. Currently, we are preparing for the final clinical testing phase. This device is intended to provide a convenient, efficient, and safe option for compensator-based IMRT delivery.