AbstractID: 11183 Title: Impact of cross scatter on CNR in fluoroscopic images taken with a dual flat panel x-ray imaging system

Purpose: To examine the impact of cross scatter on contrast-to-noise ratio (CNR) in fluoroscopic images acquired with a dual flat-panel x-ray imaging system. **Method and Materials:** An x-ray imaging system has been developed consisting of two tube/detector pairs mounted orthogonally; each chain includes a 40x30 cm amorphous silicon flat panel detector. A timing system was developed to offset the exposures of each imaging chain relative to the detector cycle which remained synchronous for both imagers. The amount of cross scatter present is dependent on several factors: kVp, mAs, time between exposures, detector lag, and object size. Several cylindrical phantoms that incorporate areas of varying contrast were used to perform CNR measurements. CNR was taken as the relative contrast between two ROIs divided by the noise, the average of the standard deviation of the contrast measured in 15 images. Effects of cross-scatter were determined by comparing CNR when both tubes were fired to CNR when only one tube was fired. Additionally, the dependence of CNR on kVp and the number of scrub frames was measured. Since cross scatter is non-uniform across the imaging plane, CNR was measured using ROIs in various regions of scatter intensity across the detector. **Results:** Preliminary results show that contrast and CNR can be reduced by up to factors of approximately 10 when cross scatter is present. Contrast reductions are greater at lower kVp. CNR reductions are greater at higher kVp. By inserting scrub frames and time delays, contrast and CNR can be restored to near the values observed without cross scatter. **Conclusion:** Cross scatter can be substantial in dual x-ray projection imaging. It's effects vary with kVp and can be alleviated by scrub frames and tube timing. **Conflict of Interest:** This research is supported in part by Varian collaboration.