AbstractID: 6806 Title: Glare Characterization in Indirect Flat Panel Detectors

Purpose: To quantify veiling glare and determine the origins of the MTF low frequency drop (lfd) in indirect x-ray flat panel detectors (FPDs), by measuring the amplitude of lost scintillation light and its characteristic propagation length.

Methods and Materials: A series of radio-opaque lead disks (1 to 35mm radius) were imaged on a GE structured CsI FPD, under different x-ray spectra (28 to 49 kVp with Rh/Rh anode/filter, with additional 0.3mm Cu filtration). The signal at the center of the disk as a function of disk radius, the disk transfer function (DTF), was used to determine the amplitude and decay length of scintillation light propagated horizontally in the detector.

Results: It is found that there are two additive constituents of glare in this detector. They have similar amplitudes of ~12%, but have respective propagation lengths of ~2 and 10mm. The shorter-range contribution diminishes in amplitude and propagation length with increasing mean x-ray energy, while the other varies oppositely. By using the DTF it was possible to correct for the MTF lfd.

Conclusions: The precise cause of the two additive contributions to glare is not yet known. Future investigations with monoenergetic x-ray beams will allow precise mapping of the energy dependence of the veiling glare. A better understanding of the physics of scintillation light propagation will allow the optimization of transmission properties in indirect detectors.