AbstractID: 6573 Title: Measurement of the 2D Presampling MTF of Digital Radiographic Systems

Methods were developed to measure the two dimensional presampling modulation transfer function (2D MTF) of digital radiography systems. The oversampled point spread function of the system was reproduced from many images of a "point source" of x-rays. Point sources were created by directing a beam of x-rays upon 0.10 mm diameter holes in copper stock. The contributions of the finite diameter point source was corrected in frequency space by the application of a sinc correction function. The 2D MTF of a computed radiography system with a 0.1 mm pixel pitch and corresponding Nyquist frequency of 5 cycles/mm was measured. The axial components of the 2D MTF were compared with 1D MTF measurements of the systems acquired using a sharp edge method. The plate transport direction MTF measured using the two methods differed by less than 7% up to 4.8 cycles/mm and the laser scan direction MTF measurements differed by less then 7% up to 3.0 cycles/mm. A greater discrepancy between the methods was demonstrated at higher frequencies. The variation of repeat measurements was less than ±5% in the plate transport direction. Findings demonstrate that direct measurement of the presampling 2D MTF of digital radiography systems is feasible using point sources with diameter equal to the pixel size of the digital system.