The MTF properties of a laboratory CR imaging system capable of scanning with a pixel size of 43 μ m were measured and investigated. An over-sampling method using tilted slit was used to measure the presampling MTFs. It was found that the MTFs measured for a CR system depend on the type of image plate used (HR or ST), X-ray spectra, band-pass frequency (for horizontal or laser scanning direction only) and laser beam power. The pixel size used for image readout affects the MTF through phase shift and aliasing. The horizontal MTFs measured remained largely the same for all pixel sizes when the over-sampling technique was used and the band-pass frequency was kept fixed. However, in actual imaging, the band-pass frequency is generally set at half of the sampling rate corresponding to the pixel size used to contain the aliasing effects. As the result, the MTFs were degraded when the band-pass frequency was set at lower value for larger pixel sizes as generally done in actual imaging. The MTFs decrease as the kVp increases. The MTFs of the ST image plates were measured to be lower than those of the HR plates. The effect of laser beam power on the MTFs was found to be measurable but small. In conclusion, the 43 μ m readout capability can improve the MTF by including more high frequency signals in the image and by allowing the use of a higher band-pass frequency.

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