Medical x-ray image receptors rely principally on the photoelectric effect for image capture and therefore induce fluorescent effects within the image receptor. The proportion of fluorescence that escapes an image screen/plate is well understood, however the absorption of this escaped fluorescence by adjacent screens has received less attention. This effect, similar in concept to light crossover in a screen/film system, results in degradation in both image contrast and resolution.

A previous computer model (McLean and Gray, Med Phys 23:1253, 1996) showed the magnitude of this effect to be up to 7% of the total energy absorbed in Gd_2O_2S screens at high kVp with values as high as 30% calculated for some BaFBr configurations. This model has been modified to calculate the MTF for this effect and applied to investigate screen/plate phosphor thickness and separation, and input beam energy on resolution. Screen/plate separation was found to be the major parameter with significant reductions in the MTF as screen separation increased. In all situations the MTF was negligible for spatial frequencies above 2 cy mm^{-1}. The reported measured resolution loses from dual BaFBr plates with inserted filters (Hinshaw and Dobbins, Med Phys **23**:871 1996) was in good agreement with calculated MTFs.

The absorption of secondary fluorescence within an image receptor is shown to degrade image resolution. This effect is maximal when the screens are increased in separation. Our investigations also show the magnitude of this effect increases if filters which fluoresce at x-ray energies are placed between the image receptor screen/plates.