

AbstractID: 5134 Title: Comparison of the Effects of Viewing Conditions and Viewing Angle on Object Detectability for Different AMLCD Displays

Purpose:

The ability to interpret images displayed on active matrix liquid crystal displays (AMLCD) can be influenced by factors such as display luminance, surrounding background, room illuminance and viewing angle. We have been investigating how these parameters influence reader scores with images featuring both small objects and low contrast as typically seen in mammography. We are in a position to make some comparisons between the results obtained with displays from two different manufacturers.

Method and Materials:

Reader studies were conducted using a computer generated contrast detail phantom alternately presented against a display background of selected luminance levels. Luminance was also measured at different viewing angles and at four selected room illuminance levels. Image scoring was performed at each combination of background level, viewing angle and room illuminance level.

Results:

Image scoring performance was interpreted using k values, which reflect the contrast and diameter of the objects detected in the images. The best image scoring results were obtained when viewing angles were kept small, and also when room illuminance was at the level of 5 – 10 lux. Better scoring results were also obtained when the image background luminance was adjusted to 5 – 20 % of maximum. These results differ from what had previously been found when evaluating displays from a different manufacturer. In this case the best scoring results were obtained at zero background and the room illuminance did not seem to have a significant effect on the results obtained when kept in the range of 0 – 20 lux.

Conclusion:

The results support the view that while it is advisable to keep the viewing angle to a minimum, it may be advisable also to adjust the room illuminance and monitor background luminance to specific levels which may be best suited for a particular AMLCD display.