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Influence of Luminance Change in Subpixels on the Occurrence of Flicker Investigated by Alternating Display of Colors on a Liquid Crystal Display

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When two different colors are alternately displayed at a high speed, a mixed color is perceived. When two images of different colors are alternately displayed on a Liquid Crystal Display (LCD), a deterrent effect on copy is expected because the color of the copied image is different from that of the perceived image. It is also expected that display color increases without improvement to the LCD. However, flicker may occur in the LCD. The purpose of this study was to clarify the conditions for flickerless alternating display. We focused on subpixels constituting pixels on the LCD, and carried out three experiments. First, we examined whether flicker was felt when the light of the subpixel was blinking, and clarified the luminance range within which flickerless blinking is possible. Second, the presence or absence of flicker was examined when two colors with the same luminance were alternately displayed. Then, the range of luminance change in subpixels in an alternating display was compared with the luminance range clarified in the first step. Third, the presence or absence of flicker and the range of luminance change on subpixels were also investigated when achromatic colors were alternately displayed. The experimental results showed that the luminance change in each subpixel was related to the occurrence of flicker.

Key Words : Switching of colors, Flicker, Liquid crystal display, Subpixels, Visual characteristic