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**Permalink**

<https://escholarship.org/uc/item/16m8c08j>

**Journal**

Journal of Vision, 2(10)

**ISSN**

1534-7362

**Authors**

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**Publication Date**

2002-12-01

**DOI**

10.1167/2.10.67

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Peer reviewed

# A new color vision test based on color from motion

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Journal of Vision December 2002, Vol.2, 67. doi:10.1167/2.10.67

## Abstract

We present a new color vision test based on an effect called color from motion (CFM) that we have described in the literature (Cicerone et al., 1995; Miyahara and Cicerone, 1997; Chen and Cicerone, 2002a,b). The CFM stimulus that we used consisted of a field of colored, randomly positioned dots on a bright achromatic background. The dots in the target region were different from those in the surround in chromaticity or luminance (or both). The stimulus consists of multiple frames, identical except that the color assignments of some dots are changed from frame to frame. When the frames are cycled rapidly, observers report that apparent motion is accompanied by subjective color spread seen in achromatic regions. Color normal individuals can see CFM in displays with dots differing only in chromaticity or only in luminance. The subject's task was to indicate the perceived direction of motion of the target region, under conditions that varied the trajectory of the target. The test was validated in two main ways. (1) Color normal and color deficient individuals viewed CFM stimuli defined by luminance differences alone to determine the smallest luminance difference between target and surround elements that is required to produce CFM. (2) Color normal and color deficient individuals viewed a CFM stimulus defined by chromaticity differences alone. In the absence of luminance differences, dichromats are incapable of performing the task above chance levels. The advantage of this test is its ease of administration, making it potentially available for use with young children and under field conditions.

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Cicerone, C. M., Hoffman, D. D., Gowdy, P. D. & Kim, J. S. (1995) The perception of color from motion. *Perception and Psychophysics*, 57, 761–777.

Miyahara E. & Cicerone M. (1997) Color from motion: separate contributions of chromaticity and luminance. *Perception*, 26, 1381–1396.