

A model for binocular summation of chromatic signals

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We investigated binocular summation of chromatic information with a color matching experiments. In each trial, a test square ($2 \times 2^\circ$) was dichotically presented to the observer. The test for the left and the right eyes had the same chromaticity, drawn from either isochromatic, L-M or S-cone axis, but differed in contrast. The task of the observer was to adjust the contrast of a match square, which had the same chromaticity and contrast for each eye, to match the appearance of the test. When the contrast difference between two eyes was small, the match contrast was about the average contrast of both eyes. However, when the binocular contrast difference was larger, the match was dominated by the higher contrast of the two eyes, regardless of the eye origin. Similar result was found in all colors, suggesting a common process underlying binocular summation in different color channels. The data can be fit by a divisive inhibition model in which the response of a monocular mechanism is a power function of contrast of stimuli presented to in that eye

divided by inhibition signals from both eyes and the performance is determined by a binocular mechanisms that linearly combines the monocular responses.

Keywords: *binocular summation, color vision, divisive inhibition model, matching.*