

**Detection in chromatic noise and visual fatigue****Sergejs Fomins<sup>1,2</sup>, Gunta Krūmiņa<sup>2</sup>**<sup>1</sup>Laboratory of Visual Perception, Institute of solid State Physics, University of Latvia, Latvia<sup>2</sup>Optometry and Vision Science Department, University of Latvia, Latvia*Corresponding author:* sergejs.fomins@gmail.com

One of the color plates designed for tiredness of color vision could be found in K. Wang Color Vision Test Plates. They resemble the Ishihara plates but with richer color palette which provide chromatic masking of stimulus. Chromatic noise is widely applied for investigation of higher order color mechanisms and thus could be applied to look into the outcome of mental fatigue on perception of color. We attempted to use the chromatic noise paradigm to investigate the influence of the fatigue on chromatic detection. The test consists of 400 squares aligned in 20 by 20 lines and rows to present a square surface of static chromatic noise (Lucassen, Bijl, Roelofsen, 2007). Isoluminant colors of background and stimuli were selected in DKL color space and subtended around 20  $\Delta E$  saturation in CIELAB. Number of hues for masking noise background were changed through the experiment, either increasing or decreasing the number of hues in chromatic noise. At the beginning all background squares were composed of only 5 hues, then the proportion of colors increased continuously in the direction of stimuli hues. C letter stimuli consist of 52 squares was presented to participants with the task to identify the direction of stimuli opening. Two colors of 180 degrees difference were used as stimuli colors. Staircase procedure is applied to obtain the psychometric functions. Stimuli and mask were presented at the same luminance (21 cd/m<sup>2</sup>) gray background at 4 expositions of 41, 90, 166, and 793 ms. Subjective fatigue scale was recorded in 14 subjects after the extensive office work. We find a correlation between fatigue scale and reduction of noise thresholds mostly for brief stimuli exposures.

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