

## **New structure for a physiological model of colour appearance.**

Chorro, E<sup>1</sup>, Perales, E<sup>1</sup>, Martínez-Verdú, FM<sup>1</sup>, de Fez, MD<sup>1</sup>, Capilla, P<sup>2</sup> and Luque, MJ<sup>2</sup>

<sup>1</sup> Dept. of Optics, Pharmacology and Anatomy, University of Alicante, 03690 Alicante Spain

<sup>2</sup> Dept. of Optics, University of Valencia, 46100 Burjassot Spain

Since some decades, there is an ambitious scientific objective focused on the development of an integral colour perception model, which permits to correlate physical parameters (luminance, purity, etc) of visual stimuli with perceptual attributes (brightness, hue, colourfulness, etc). This problem has been tackled from different scientific approaches. Some works only try to fit one data set for reproducing so far as possible other data, and usually good results are obtained using this type of models. One example of that it is the CIECAM02 model, which is the latest colour appearance model adopted by CIE (CIE, 2004, A Colour Appearance Model for Colour Management Systems: CIECAM02. CIE Publ. 159). On the other hand, other studies try to take into account the visual pathways of the human visual system combining such as psychophysical as neurophysiological data (De Valois et al, 1997, *Vision Research*, 37(7) 885-897; Valverg et al, 2008, *Color Research and Application*, 33(6) 433-443; Gómez-Chova, et al, 2005, ATTD: a new colour vision model based on the physiology of the visual system, AIC'05, Granada, Spain, 1007-1010). Although they cannot fit some parameters as well as other models, they are useful and powerful tools for understanding of the process that have place in the human visual system. Particularly, our aim is to reconcile both ideas: trying to obtain a (physiological) neural model for colour perception that can reproduce colour appearance data such as unrelated and related colour stimuli. For this reason and considering new works (Wueguer et al, 2005, The cone inputs to the unique-hue mechanisms, *Vision Research*, 45 3210–3223; Johnson et al, 2004, Cone inputs in Macaque Primary Visual Cortex, *J. Neurophysiol*, 91 2501-2514), we have redesigned the previously shown ATTD05 model, giving more importance to the stage of the cortical process which was underestimated in the previous version.

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