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The human foveal confluence and high resolution fMRI

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Publication Details

Schira, M. M. (2012). The human foveal confluence and high resolution fMRI. *Journal of Vision*, 12 (9), 1396-1-1396-1.

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Abstract

Abstract presented at the Vision Sciences Society meeting, 11-16 May 2012, Naples FL.

Keywords

foveal, human, confluence, high, fmri, resolution

Disciplines

Education | Social and Behavioral Sciences

Publication Details

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After remaining terra incognita for 40 years, the detailed organization of the foveal confluence has just recently been described in humans. I will present recent high resolution mapping results in human subjects and introduce current concepts of its organization in human and other primates (Schira et al., J. Nsci, 2009). I will then introduce a new algebraic retino-cortical projection function that accurately models the V1-V3 complex to the level of our knowledge about the actual organization (Schira et al. PLoS Comp. Biol. 2010). Informed by this model I will discuss important properties of foveal cortex in primates. These considerations demonstrate that the observed organization though surprising at first hand is in fact a good compromise with respect to cortical surface and local isotropy, proving a potential explanation for this organization. Finally, I will discuss recent advances such as multi-channel head coils and parallel imaging which have greatly improved the quality and possibilities of MRI. Unfortunately, most fMRI research is still essentially performed in the same old 3 by 3 by 3 mm style - which was adequate when using a 1.5T scanner and a birdcage head coil. I will introduce simple high resolution techniques that allow fairly accurate estimates of the foveal organization in research subjects within a reasonable timeframe of approximately 20 minutes, providing a powerful tool for research of foveal vision.

Meeting abstract presented at VSS 2012