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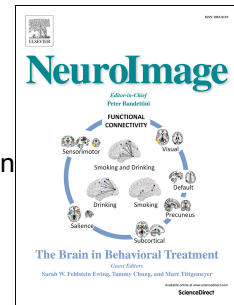
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Representation of steady-state visual evoked potentials elicited by luminance flicker in human occipital cortex: an electrocorticography study

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Abstract

Despite the widespread use of steady-state visual evoked potentials (SSVEPs) elicited by luminance flicker in clinical and research settings, their spatial and temporal representation in the occipital cortex largely remain elusive. We performed intracranial-EEG recordings in response to targets flickering at frequencies from 11 to 15 Hz using a subdural electrode grid covering the entire right occipital cortex of a human subject, and we were able to consistently locate the gazed stimulus frequency at the posterior side of the primary visual cortex (V1). Peripheral flickering, undetectable in scalp-EEG, elicited activations in the interhemispheric fissure at locations consistent with retinotopic maps. Both foveal and peripheral activations spatially coincided with activations in the high gamma band. We detected localized alpha synchronization at the lateral edge of V2 during stimulation and transient post-stimulation theta band activations at the posterior part of the occipital cortex. Scalp-EEG exhibited only a minor occipital post-stimulation theta activation, but a strong transient frontal activation.

keywords

SSVEP, ECoG, alpha, theta, gamma, fundamental, harmonic

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