

# Cross-frequency interaction of the eye-movement related LFP signals in V1 of freely viewing monkeys

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Recent studies have emphasized the functional role of neuronal activity underlying oscillatory local field potential (LFP) signals during visual processing in natural conditions. While functionally relevant components in multiple frequency bands have been reported, little is known about whether and how these components interact with each other across the dominant frequency bands. We examined this phenomenon in LFP signals obtained from the primary visual cortex of monkeys performing voluntary saccadic eye movements on still images of natural scenes. We identified saccade-related changes in respect to power and phase in four dominant frequency bands: delta-theta (2-4 Hz), alpha-beta (10-13 Hz), low-gamma (20-40 Hz), and high-gamma (>100 Hz). The phase of the delta-theta band component is found to be entrained to the rhythm of the repetitive saccades, while an increment in the power of the alpha-beta and low-gamma bands were locked to the onset of saccades. The degree of the power modula