

## **THE INFLUENCE OF FIXATIONAL EYE MOVEMENTS ON GRATING-ELICITED RESPONSES OF V1 NEURONS**

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In alert monkeys, as in humans, small eye movements - tremor, drift and small saccades - occur during fixation periods. These movements constantly shift retinal image, thus modifying the stimulus-generated responses. We analyzed the effects of eye movements on responses of simple and duplex ("complex-like") cells to drifting sinusoidal gratings. Eye positions were recorded from monkeys trained to perform a fixation task. During fixation extracellular responses of V1 neurons in parafoveal region and eye positions were recorded. From the eye position records we identified epochs of fast movements, slow drifts and stable fixation and compared patterns of neuronal firing during the various eye movement phases. Neuronal responses were sensitive to both fast and slow eye movements that occurred during grating presentations. In the case when no periods of eye movements were excluded from the records, averaging across many repetitions of the grating temporal cycle resulted in smearing of the response time course, although each individual sweep produced a modulated response. Eye movements affect neuronal responses in a way that depends on eye movement trajectory, stimulus parameters and receptive field properties. In particular, eye movements caused shifts in response phase and/or duration, produced spurious firing bursts or caused cells to miss a response. Our results suggest that fixational eye movements account for variations in neuronal responses over successive grating presentations and that these movements should be considered in analysis of grating-evoked activity.