

Abstract View

RESPONSES OF LOOMING SENSITIVE NEURONS TO CHANGES OF OBJECT CONTRAST

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Looming is an apparent increase in the size of an approaching or receding object and can be used to assess changes in the distance between an observer and object. Intracellular recordings of identified neurons in the visual system of *Manduca sexta* (Sphingidae, Lepidoptera) reveal two cell classes that are sensitive to the retreat or approach of an object. Stimulation with different looming stimuli and illusions (such as a rotating spiral) reveals that these cell types use different visual cues to determine direction and speed of depth motion. The cardinal cues are change of perimeter length for class 1 neurons and expansion or contraction visual flow fields for class 2 neurons (Wicklein and Strausfeld 2000). None of the cells in either class respond when the object and background change their brightness together, thus increasing the overall brightness of the scene but not the contrast between the object and the background. We examined the effects of contrast and found that looming-sensitive cells in both classes are sensitive to changes of object contrast. The amplitude tuning is variable between cells whereas all cells tested respond best to rapid contrast changes. These properties were reproduced in a computational model of these cells.

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