

## Abstract View

## RESPONSES OF LOOMING-SENSITIVE NEURONS IN MANDUCA SEXTA TO OBJECTS DIFFERING IN SIZE, VELOCITY AND CONTRAST

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In previous experiments we recorded from looming-sensitive neurons in the hawkmoth *Manduca sexta* and distinguished two cell classes, which differed in their morphologies and response properties: Class 1 cells were driven by an increase in perimeter length; Class 2 cells were stimulated by expansion/contraction flowfields (Wicklein and Strausfeld 2000). We used anatomical and physiological data to build a network model of these cells with MATLAB and simulated the responses of these neurons with the same stimuli that were used during the physiological characterization of the neurons (Wicklein and Sejnowski 2001). In particular, the model for Class 1 cells predicted how the response should vary with contrast, size and movement velocity of the stimulus; Class 1 cells should be insensitive to the initial size of expanding/contracting objects, but should code for the velocity of the expansion/contraction. In addition the response should increase with increasing contrast between the object and the background. To test these predictions, we measured tuning curves for Class 1 cells to three stimulus parameters - contrast, movement velocity and object size. Preliminary results show that class 1 cells are insensitive to the initial size of an expanding/contracting object as predicted by the model and the animal's behavior, but they also seem to be insensitive to different velocities. In addition, the cells respond sensitively to low contrast objects, as expected for crepuscular moths.

Literature cited: Wicklein M, Strausfeld NJ (2000) *J. Comp Neurol* 424:356-376; Wicklein M, Sejnowski TJ (2001) *Neurocomputing*, in press

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