1125-37-275 **Pamela B. Pyzza*** (pbpyzza@owu.edu), 61 S. Sandusky St., Delaware, OH 43015, and **Gregor Kovacic** and **David Cai**. *Idealized Models of Insect Olfaction.*

When a locust detects an odor, the stimulus triggers a specific sequence of network dynamics of the neurons in its antennal lobe. The odor response begins with a series of synchronous oscillations, followed by a short quiescent period, with a transition to slow patterning of the neuronal firing rates, before the system finally returns to a background level of activity. We begin modeling this behavior using an integrate-and-fire neuronal network, composed of excitatory and inhibitory neurons, each of which has fast-excitatory, and fast- and slow-inhibitory conductance responses. We further derive a firing-rate model for each (excitatory and inhibitory) neuronal population, which allows for more detailed analysis of and insight into the plausible olfaction mechanisms seen in experiments, prior models, and our numerical model. We conclude that the transition of the network dynamics through fast oscillations, a pause in network activity, and the slow modulation of firing rates can be described by a system which has a limit cycle of the fast variables, slowly passes through a saddle-node-on-a-circle bifurcation eliminating the oscillations, and, eventually, slowly passes again through the bifurcation point, producing a new limit cycle with a slower period. (Received August 22, 2016)