1106-92-720 **Pamela B Fuller*** (fullep@rpi.edu), Dept. of Mathematical Sciences, Rensselaer Polytechnic Institute, 110 8th St., Troy, NY 12180, **Gregor Kovacic** (kovacg@rpi.edu), Dept. of Mathematical Sciences, Rensselaer Polytechnic Institute, 110 8th St., Troy, NY 12180, and **David Cai** (cai@cims.nyu.edu), Courant Institute, 251 Mercer St., New York, NY 10012.
Integrate-and-Fire Model of Insect Olfaction.

When an insect detects an odor, the stimulus triggers a series of synchronous oscillations of the neurons in its antenna lobe. These oscillations are followed by slow dynamical modulation of the firing rates, which continues after the stimulus has been turned off. I model this behavior by using an Integrate-and-Fire neuronal network with excitatory and inhibitory neurons. The inhibitory response of both types of neurons contains a fast and slow component. The fast component, together with the excitation, creates the initial oscillations while the slow component suppresses them and aids in the creation of the slow patters that follow. During the initial oscillations, the stimulus can be identified by determining the specific subset of excitatory neurons that participate consistently in every cycle of the oscillations. I have reduced the model to a mean field model where the excitatory and inhibitory neurons are each considered as a population. Each population has a mean firing rate, so the collection of individual spike inputs is estimated as a slowly varying continuous function. The mean field model strongly agrees with numerical simulations of an all-to-all coupled neuronal network as both produce the proper spike behavior with similar parameter values. (Received September 05, 2014)