1063-92-213 **Joe Latulippe***, Department of Mathematics and Statistics, Cal Poly Pomona, 3801 West Temple Ave., Pomona, CA 91768. *A Mathematical Model for Stimuli Dependent Neuron Responses.*

The transmission of information between neurons typically occurs at synaptic junctions. At these junctions, a pre-synaptic potential initiates the release of neurotransmitters that bind to channels on the post-synaptic cell. These channels open and close allowing the flow of ions across the post-synaptic cell membrane. Although pre- and post-synaptic processes control how and when neuronal information is transmitted, generally speaking, synaptic transmission is a random process. In order to get a better idea of how neurons are affected by stochastic inputs, we present a simple integrate-and-fire neuron model that incorporates random post-synaptic inputs. We investigate how in vivo-like stochastic inputs affects the response of the single cell model. By controlling both an excitatory and inhibitory conductance, the model can reproduce in vivo-like behavior due to random firing of pre-synaptic neurons. (Received August 16, 2010)