

1125-92-2905

**Zeynep Akcay\*** (zakcay@qcc.cuny.edu), zakcay@qcc.cuny.edu, and **Xinxian Huang, Farzan Nadim** and **Amitabha Bose**. *Phase resetting and bistability in a neuronal network*.

The behavior generated by neuronal networks depends on the phase relationships of its individual neurons. Observed phases result from the combined effects of individual cells and synaptic connections whose properties change dynamically. We consider a recurrent network of two oscillatory neurons that are coupled with reciprocal synapses. We use feed-forward descriptions of the phase response curves of the neurons and the short-term synaptic plasticity properties to define Poincare maps for the activity of the network. The fixed points of these maps correspond to the phase locked modes of the network. Using these maps, we analyze the creation of bistable phase locking solutions in neuronal networks when there is short-term synaptic depression from one neuron to another. We discuss how achievement of bistable solutions depend on the phase response curves of the neurons and the dynamics of the short-term synaptic plasticity. We illustrate our findings in Quadratic Integrate-and-Fire and Morris-Lecar neuron models. (Received September 21, 2016)