1125-92-117 **R. Melody Takeuchi*** (ryusei.takeuchi@tufts.edu), 503 Boston Ave., Medford, MA 02155, and **Christoph Borgers**. *Effects of recurrent excitation in neuronal network models.*

We call the mutual synaptic excitation of neurons belonging to the same local network "recurrent excitation". We ask what conditions lead to regular neuronal firing and/or high-frequency runaway activity in neurons and neuronal networks with recurrent excitation. We examine this question by analytically and numerically analyzing the parameters in several neuronal models. These include 1) the self-exciting theta neuron, 2) the self-exciting, self-inhibiting LIF neuron, and 3) strong and weak PING network models with NMDA and AMPA receptor-mediated synapses. We find minimum requirements needed to create a "bump" mechanism whereby sudden transitions from low firing frequency to high-frequency runaway activity can occur. Analysis of such systems may give insight into the onset of seizures, and also into persistent firing. That is, firing fueled by recurrent excitation, which is thought to be the neuronal basis of working memory. (Received August 02, 2016)