

**Meeting:** 1007, Santa Barbara, California, SS 1A, Special Session on Dynamical Systems in Neuroscience

1007-92-40            **Maxim Bazhenov\*** (bazhenov@salk.edu), Salk Institute, 10010 N Torrey Pines Rd, La Jolla, CA 92037, and **Nikolai Rulkov** (nrulkov@ucsd.edu), INLS, UCSD, 9500 Gilman Drive, La Jolla, CA 92093. *Role of network dynamics in shaping spike timing reliability.*

We study the reliability of cortical neuron responses to periodically modulated stimuli. Simple map-based models of different types of cortical neurons are constructed to replicate the intrinsic resonances of reliability found in experimental data and to explore the effects of those resonance properties on collective behavior in a cortical network model containing excitatory and inhibitory cells. We show that for periodic inputs (sine waves or superposition of rate modulated Poisson distributed spike trains) map-based neurons respond with high reliability within a specific narrow frequency range. Network interactions enhance the frequency range of reliable responses for weak stimuli and can also change the exact position of reliability peaks in the frequency domain. The study suggests that plasticity of synaptic coupling in the networks of excitatory and inhibitory neurons may control the information processing through the system. (Received December 27, 2004)