1053-37-347 **M. Drew LaMar*** (mdlama@wm.edu), Department of Applied Science, The College of William and Mary, 311 McGlothlin-Street Hall, Williamsburg, VA 23187, and **Gregory D. Smith** (greg@wm.edu), Department of Applied Science, The College of William and Mary, 305 McGlothlin-Street Hall, Williamsburg, VA 23187. *Synchronization of pulse-coupled oscillators on random directed networks.*

A network of pulse-coupled oscillators is an effective model in the study of neural synchronization. In this talk, we explore the effect of correlations between the in- and out-degrees (i.e. node-degree correlations) of random directed networks on the synchronization of identical pulse-coupled oscillators. We demonstrate through numerical experiments that networks with negative node-degree correlation are less likely to achieve global synchrony and synchronize more slowly than networks with positive node-degree correlation. Pulse-coupled oscillator networks with negative node-degree correlation often exhibit multiple coherent attracting states, with trajectories performing fast transitions between them. These effects of node-degree correlation on dynamics of pulse-coupled oscillators are consistent with aspects of network topology (e.g., the effect of node-degree correlation on the eigenvalues of the Laplacian matrix) that have been shown to affect synchronization in other contexts. (Received September 08, 2009)