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**Maxim S Shkarayev\*** ([shkarm@rpi.edu](mailto:shkarm@rpi.edu)), Dept. of Mathematical Sciences Amos Eaton 301, 110 8th Street, Troy, NY 12180. *Functional connectivity in disassortative scale-free neuronal networks.*

We present a study of scale-free networks of identical, conductance-based, integrate-and-fire excitatory neurons. We show that dynamics on a complex network can be controlled by the topology of the network, in particular, scale-free functional connectivity can arise from scale-free architectural connectivity, in which the architectural degree-correlation plays a crucial role. The analytical results are confirmed by the direct numerical simulations of the coupled integrate-and-fire neuronal networks. (Received February 22, 2010)