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Stanley L. Tuznik* (slt5237@psu.edu). *The Neurodynamics of Bursting Oscillations in the Hindmarsh-Rose Model*. Preliminary report.

The Hindmarsh-Rose model is a popular choice for simulating the behavior of a single neuron, as it is able to capture, qualitatively, the spiking and bursting behaviors that are observed experimentally. This three-dimensional nonlinear system relies on a slow adaptation variable which dynamically switches the neuron from a period of firing to a quiescent period, a phenomenon known as bursting. We describe the underlying mechanism behind the bursting by reducing the model to a single-parameter system in the phase plane. We then consider a simplified version of coupled oscillators used to model the coupling of two such neurons. (Received September 15, 2014)