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Eddy Kwessi* (ekwessi@trinity.edu), 1 Trinity Place, San Antonio, TX 78212, and **Lloyd Edwards** (ljedward@uab.edu), Birmingham, AL. *Non standard Discrete Model in Neurosciences: The FitzHugh Nagumo model with time delay*. Preliminary report.

It is well known that the human brain contains a large number of neurons that often evolve in large neural networks. These neural networks represent groups of neural populations where each element interacts, under excitement impulses with other elements. One model used to model the behavior of these ensembles of neurons is the FitzHugh-Nagumo system. This system consists of two ordinary differential equations linking an activator and an inhibitor, and represents the excitability of the neural network. In this paper, we propose a non-standard discrete version of the FitzHugh-Nagumo model. We make the case that this version, unlike a standard discretization using for example an Euler Method, preserves the dynamics of the continuous original system. This model also has a time-delay parameter that is useful to explain delay response in neuron firing. We also show that this discretization is well suited for parameter estimation using Monte-Carlo simulations. (Received August 05, 2018)