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**Peter V. Gordon\*** (pgordon@uakron.edu), Department of Mathematics, The University of Akron, Akron, OH 44325. *Periodic solutions for fire-diffuse-fire model with nonlinear absorption.*

Calcium dynamics plays an important role in intracellular communication in living cells. The fire-diffuse-fire model, which accounts for the effects of diffusion, absorption, and localized release of calcium, has been successfully used to model the initiation, propagation and failure of calcium waves and other spatio-temporal patterning of intracellular calcium. Previous theoretical studies were usually performed under the assumption of a linear absorption mechanism. In this talk I will present a simple and robust method to construct various periodic solutions for arbitrary types of absorption for the one-dimensional fire-diffuse-fire model. I will then give examples of such periodic waves and discuss their stability. Finally, I will present numerical results showing that certain periodic solutions are robust in the sense that they are insensitive to the failure or delay of the localized release of calcium. This is a joint work with Louis Tao (Peking University). (Received August 24, 2012)