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Xiaoying Han* (xzh0003@auburn.edu) and **Peter Eris Kloeden**
(kloeden@na.uni-tuebingen.de). *Sigmoidal Approximation of Neural Networks with Binary States.*

Heaviside functions are often used to model neural networks with two-state threshold neurons. Dynamics of such models are often difficult to analyze due to the discontinuity in the vector field. In this talk we introduce a discrete sigmoidal neural field system that is developed based on an Amari-Hopfield neural field model, in which the Heaviside function is replaced by a simplifying sigmoidal function characterized by a small parameter. It will be shown that the solutions to the sigmoidal approximating system converge to the solution of the Heaviside system. Structures of the attractors for the sigmoidal system will also be compared to the attractor for the Heaviside system. (Received January 18, 2021)