

1116-37-1497

**Yixin Guo** and **Aijun Zhang\*** (az003@uark.edu), Department of Mathematical Sciences, 309 SCEN -1 University of Arkansas, Fayetteville, AR 72701. *Existence and Nonexistence of Traveling Pulses in a Lateral Inhibition Neural Network.*

We study the spatial propagating dynamics in a neural network of excitatory and inhibitory populations. Our study demonstrates the existence and nonexistence of traveling pulse solutions with a nonsaturating piecewise linear gain function. We prove that traveling pulse solutions do not exist for such neural field models with even(symmetric) couplings. The neural field models only support traveling pulse solutions with asymmetric couplings. We also show that such neural field models with asymmetric couplings will lead to a system of delay differential equations. We further compute 1-bump traveling pulse solutions using the system of delay differential equations. Finally, we develop Evans functions to assess the stability of 1-bump traveling pulse solutions. (Received September 20, 2015)