

Nagumo RDEs on graphs

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Abstract

Nagumo equations on graphs have exponential number of stationary solutions in the case when the reaction dominates the diffusion. In contrast, for sufficiently strong diffusion there are only constant stationary solutions. We show that the emergence of the spatially heterogeneous solutions is closely connected to the second eigenvalue of the Laplacian matrix of a graph, the algebraic connectivity. For graphs with simple algebraic connectivity, the exact type of bifurcation of these solutions is implied by the properties of the corresponding eigenvector, the so-called Fiedler vectors.