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Title: Using sun-star calculus for normal form calculations in neural field equations.

Abstract:

Neural field models with transmission delay may be cast as abstract delay differential equations (DDE). The theory of dual semigroups (also called sun-star calculus) provides a natural framework for the analysis of a broad class of delay equations, among which DDE. In particular, it may be used advantageously for the investigation of stability and bifurcation of steady states. After introducing the neural field model in its basic functional analytic setting and discussing its spectral properties, we present an extensive study of two pitchfork-Hopf bifurcations for a 1D neural field model with 'Wizard hat' type connectivity.

1. van Gils, S. A., Janssens, S. G., Kuznetsov, Y. A., & Visser, S. (2013). On local bifurcations in neural field models with transmission delays. *Journal of mathematical biology*, 66(4-5), 837-887.
2. Dijkstra, K., van Gils, S. A., Janssens, S. G., Kuznetsov, Y. A., & Visser, S. (2015). Pitchfork-Hopf bifurcations in 1D neural field models with transmission delays. *Physica D: Nonlinear Phenomena*.