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PERCEPTUAL BINARY DECISION-MAKING MODEL WITH TIME DELAY AND HILL FUNCTION

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ABSTRACT

The results from a paper by Morawski & Czartoszewska [1] about a neural mass perceptual decision-making model introduced by Piskala et al. [2] are presented. The model describes the activity of two neuron populations influenced by each other and external signals. The groups' activities correspond to the process of making a perceptual binary decision and are modeled through a system of delay differential equations. Existing results are generalized by investigating the impact of both a delay in the self-inhibition and a generic Hill coefficient on solutions to the system of differential equations, with the focus on stability and the Hopf bifurcation. Several versions of the model with various assumptions are compared using analytical and numerical methods, providing insight into the impact of the modifications.

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