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Time delayed analysis of a firefly flash model

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This study presents a time-delayed analysis of a firefly flash model derived from the bioluminescent mechanism of fireflies[1]. The model is formulated on the basis of the well-established enzymatic reactions responsible for light emission. Numerical findings are validated against experimentally reported results. Additionally, multiple peak pulses at low temperatures, including double peak pulses that appear through period-doubling bifurcation, are satisfactorily explained by the time-delayed firefly model.

Reference:

[1] D. Saikia and M. P. Bora, "Nonlinear model of the firefly flash", Nonlinear Dynamics, vol. 101, no. 2, pp. 1301-1315, 2020.

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