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Chaos in the predator–prey equation with periodic coefficients, and in related planar systems

We show the presence of chaotic-like dynamics in the classical Lotka–Volterra predator–prey system with periodic coefficients. The proof is based on a new topological approach for the detection of chaotic dynamics and a connection to the theory of “Linked Twist Maps”. We also present some other examples of simple ODEs where the existence of chaos can be proved by similar geometric features.

This is a joint work with Marina Pireddu from the Department of Mathematics and Computer Science, University of Udine.