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Stability of Periodic Fixed Points and Invariant Sets of the Modulated Logistic Map.

In this talk, we are studying the stability of the 1- and 2-periodic fixed points and the invariant sets of the two-dimensional dynamical system proposed by Elhadj and Sprott in [1]. The map exemplifies a slave-master relationship where the first, master component is defined by the logistic map and the second is also a logistic map regulated by the first component. We begin by finding the fixed points of the map and determine their stability as a function of its three parameters a , b , and c . In certain parametric regimes, we further analyze the basin of attraction of stable fixed points and fully describe the dynamics of arbitrary initial data. Lastly we want to numerically and analytically determine the invariant sets of the second component in the domain $[0, 1]$ as it usually represents the validity region for the underlying models. We will detail our analysis using computer graphics and simulations to demonstrate our results.

[1]Elhadj, Zeraoulia, and J. C. Sprott. "The effect of modulating a parameter in the logistic map." *Chaos: An Interdisciplinary Journal of Nonlinear Science*. 18.2 (2008): 023119. (Received September 25, 2017)