BIFURCATIONS OF 2-PERIODIC NON AUTONOMOUS STUNTED TENT SYSTEMS

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Parameters in real world situations very often are not constant with time. In that cases, the evolutionary equations have to depend explicitly on time. Then the classical theory of autonomous dynamical systems is no longer applicable and we get into the field of nonautonomous dynamical systems. In this work we will consider a family of 2-periodic non autonomous dynamical systems, generated by the alternate iteration of two stunted tent maps and study its bifurcation structure.

References

[1] J.S. Cánovas, A. Linero, D. Peralta-Salas. (2006). *Dynamic Parrondos paradox*, Physica D: Nonlinear Phenomena, 218 **(2)**, 177–184.

[2] N. Franco, L. Silva and P. Simões. (2013). *Symbolic dynamics and renormalization of nonautonomous k periodic dynamical systems*, Journal of Difference Equations and Applications, **19**, 27–38.

[3] R. S. Mackay and C. Tresser. (1987). *Some flesh on the skeleton: The bifurcation structure of bimodal maps*, Physica D: Nonlinear Phenomena, 27 **(3)**, 412–422.

[4] I. Sushko, V. Avrutin and L. Gardini. (2015). *Bifurcation structure in the skew tent map and its application as a border collision normal form*, Journal of Difference Equations and Applications, **22**, 1040–1087.