GLOBAL DYNAMICS OF ANTI-COMPETITIVE SYSTEMS IN THE PLANE

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Abstract. We give some general results about global dynamics of an anti-competitive system of the form

\[
\begin{align*}
x_{n+1} &= T_1(x_n, y_n) \\
y_{n+1} &= T_2(x_n, y_n)
\end{align*}
\]

where \( T_1 : I \times J \to I \) and \( T_2 : I \times J \to J \), and functions \( T_1 \) and \( T_2 \) are continuous and \( T_1(x, y) \) is non-increasing in \( x \) and non-decreasing in \( y \) while \( T_2(x, y) \) is non-decreasing in \( x \) and non-increasing in \( y \). We illustrate our results by means of an example which shows a variety of typical dynamical behavior for an anti-competitive system.

Keywords. Competitive map, global stable manifold, monotonicity, period-two solution, unstable.

References


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