

Global Dynamics of Anti-Competitive Systems in the Plane

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

$$\begin{cases} x_{n+1} = T_1(x_n, y_n) \\ y_{n+1} = T_2(x_n, y_n) \end{cases}, \quad n = 0, 1, 2, \dots$$

where

$$T_1 : \mathcal{I} \times \mathcal{J} \rightarrow \mathcal{I}, \quad T_2 : \mathcal{I} \times \mathcal{J} \rightarrow \mathcal{J} \quad \text{and} \quad (x_0, y_0) \in \mathcal{I} \times \mathcal{J},$$

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 wide variety of typical dynamical behavior for an anti-competitive system.