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M. R. S. Kulenovic* (mkulenovic@mail.uri.edu), Department of Mathematics, Lippitt Hall, Kingston, RI 02881. *Invariant Manifolds for Competitive Discrete Systems in the Plane - Non-hyperbolic Case.*

Let T be a competitive map on a rectangular region $\mathcal{R} \subset \mathbb{R}^2$, and assume T is C^1 in a neighborhood of a fixed point $\bar{x} \in \mathcal{R}$. We present the results which give conditions on T that guarantee the existence of an invariant curve emanating from \bar{x} when both eigenvalues of the Jacobian of T at \bar{x} are nonzero and at least one of them has absolute value less than one, and establish that \mathcal{C} is an increasing curve that separates \mathcal{R} into invariant regions. We emphasize the importance of this result in non-hyperbolic cases, and show that it can be effectively used to determine basins of attraction of fixed points of competitive maps, or equivalently, of equilibria of competitive systems of difference equations. The emphasis in applications in this paper is to planar systems of difference equations with non-hyperbolic equilibria, where we establish a precise description of the basins of attraction of finite or infinite number of equilibrium points. (Received September 20, 2010)