Dynamical transition for a 3-component Lotka-Volterra Model with Diffusion

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Abstract

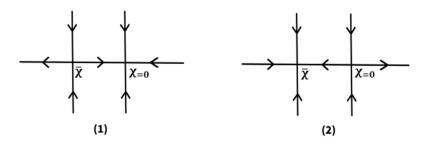
The main objective of this article is to investigate the dynamical transition for a 3-component Lotka-Volterra model with diffusion. Based on the spectral analysis, the principle of exchange of stability conditions for eigenvalues are obtained. In addition, when α_0 delta_0<\delta_1\$, the first eigenvalues are complex, and we show that the system undergoes a continuous or jump transition. In the small oscillation frequency limit, the transition is always continuous and the time periodic rolls are stable after the transition. In the case where α_0 delta_1\$, the first eigenvalue is real. Generically, the first eigenvalue is simple and all three types of transition are possible. In particular, the transition is mixed if α_0 delta_{\omega}e_{k_0}^3dx/neq 0\$, and is continuous or jump in the case where α_0 delta_1\$ as α_0 . In this case we also show that the system bifurcates to two saddle points on α_0 delta_1\$ as α_0 delta_1\$ delta_

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Wu_LI_LI.pdf available at https://authorea.com/users/310868/articles/475466-dynamical-transition-for-a-3-component-lotka-volterra-model-with-diffusion

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