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Propagation Direction of Traveling Waves to a Competitive Integrodifference System with Bistable Nonlinearity

Traveling wave propagation is a significant phenomenon observed in population biology. Due to the occurrence of nonlocal effect in integrodifference systems, a deep understanding of the wavefront in the propagation direction is challenging. In this paper, we study the sign of wave speed for bistable traveling waves to a two-species competitive integrodifference system that biologically models the dynamics of two species in competition for a common resource. By a proper choice of the kernel functions, we transfer our model into a coupled functional differential system and shed a new light on how to determine the wave speed sign. Sufficient conditions with symmetry are obtained on the propagation directions of the wavefronts. This symmetry is further verified in the final analysis and numerical simulations are provided to illustrate our theoretical results. This talk is based on a joint work with Drs. Guo Lin and Chunhua Ou.