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Bistable wave speed of a Lotka-Volterra system with nonlocal dispersal

In this talk, I will report our recent research on the speed of traveling wave solutions to a nonlocal dispersal Lotka-Volterra competition model with bistable nonlinearity. Firstly, we establish the value range of the bistable wave speed in terms of spreading speeds of monostable traveling waves in the system. Without any extra requirement on the system parameters, we prove that the bistable wave speed is unique by means of the asymptotic behaviors of the waves near the two stable equilibria. Moreover, comparison principles on wave speeds are established as long as we can find an upper or lower solution with specific speed. Practically, to find or control the speed sign of the propagation (moving direction), we utilize the decay rate of the standing wave (or almost standing wave) to construct test functions so that these functions become upper or lower solutions with almost zero speed for the given parameter sets. Naturally, this provides an insight to obtain (or control) the propagation direction by adjusting the parameter values, which is biologically significant in the study of wave propagation phenomena.