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Global dynamics of two-species competition reaction-diffusion systems in a time-varying domain

In this talk, we investigate the global dynamics of a two-species competition reaction-diffusion model in a time-varying domain under the homogeneous Dirichlet and Neumann boundary conditions. Under appropriate conditions, we establish the competitive exclusion principle for asymptotically bounded and periodic domains, respectively. By the method of upper and lower solutions and comparison arguments, we prove that one species will exclude the other in an asymptotically unbounded domain. We further apply the analytic results to a Lotka-Volterra competition model for its global dynamics and conduct numerical simulations to illustrate our findings.