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Propagation phenomena for a vector-host disease model

In this talk, I will report our recent research on a vector-host disease system, which models the invasion of vectors and hosts to a new habitat. Combining the uniform persistence idea from dynamical systems with the properties of the corresponding entire solutions, we study the asymptotic spreading phenomena in two different cases: (1) fast susceptible vector; (2) slow susceptible vector when the disease spreads. It turns out that in the former case, the susceptible species spreads faster than the infected species, which leads to two separate fronts with different speeds; while in the latter case, the infected species always catch up with the susceptible species, and three species almost spread as a single front. We also present some numerical simulations to illustrate our analytic results.