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Spreading speeds and traveling waves for a reaction-diffusion model

Spreading speeds and traveling waves for systems of reaction-diffusion equations are often used to understand and manage biological invasions. Much research work on spreading speeds has been done for cooperative reaction-diffusion systems. In this talk, we shall establish the spreading speed for a large class of non-cooperative reaction-diffusion systems and characterize the spreading speed as the slowest speed of a family of traveling wave solutions. The results are applied to a non-cooperative system describing interactions between ungulates and grass. We shall identify conditions on the parameters under which a population of ungulates can invade an infinite grassland.