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Propagation dynamics of a class of epidemic models with different diffusion speeds in a strip region

In this talk, I will report our research on a special SIR model in a stripe region, where infective individuals have a different diffusion speed on one side of the stripe and Dirichlet homogeneous boundary conditions are imposed on the other side. By using the comparison principle and constructing the upper and lower solutions, we establish the existence and uniqueness of the nontrivial steady state under some appropriate conditions. Moreover, we obtain the local uniform convergence of solutions of the Cauchy problem and a threshold-type result. We also prove the existence of the asymptotic spreading speed along the horizontal axis.