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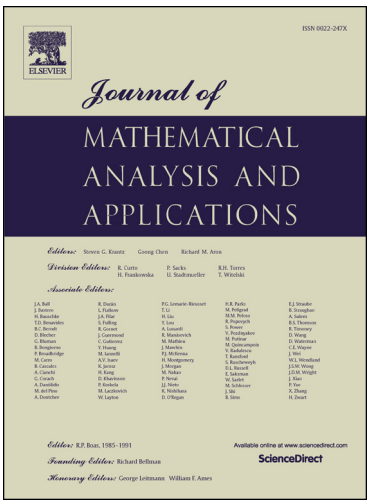

Dynamics of a class of delayed reaction-diffusion systems with Neumann boundary condition

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Dynamics of a class of delayed reaction-diffusion systems with Neumann boundary condition *

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Abstract. This paper considers a class of delayed reaction-diffusion systems under the Neumann boundary condition which arise in epidemiology and can describe the temporal and spatial evolutionary phenomena for the bacteria population and the human infective population. With the help of the iterative properties of interval mapping and dynamical system approaches, some positively invariant sets and attractive basins of the considered systems are analyzed detailedly. In addition, combining the global attractivity of interval mapping, we provide some sufficient conditions to ensure local or global attractivity of steady states of the systems. Finally, we apply these theoretical results to some models with different nonlinearity demonstrating "force of infection", and then obtain some sufficient conditions about "force of infection" to describe the survival and extinction of bacteria and infective populations.

Key words: Attraction basin; bacteria-infective population model; delayed reaction-diffusion equation

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