

数学与系统科学研究院

计算数学所学术报告

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报告题目:

**Study on Travelling Wave for
Nicholson's Blowflies Equation**

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上午 10:00

报告地点: **科技综合楼三层 301**

计算数学所小报告厅

Abstract:

In this talk, we study asymptotic stability of travelling wave solutions for Nicholson's Blowflies equation, a time-delayed reaction-diffusion equation, with local or nonlocal nonlinearity.

It is known that, when the ratio of birth rate coefficient and death rate coefficient p/d lies between 1 and e , the Nicholson's Blowflies equation is monotone and possesses monotone traveling wave solutions. When the rate is larger than e , however, the equation loses its monotonicity and may possess nonmonotone travelling wave solutions. In our recent work on Nicholson's Blowflies equation with local nonlinearity, we have shown asymptotic stability of travelling solutions, together with some numerical simulation. Briefly, when p/d lies between e and e^2 or p/d is larger than e^2 with a small delay time, monotone and nonmonotone are exponentially stable.

For Nicholson's Blowflies equation with nonlocal nonlinearity, we obtain similar numerical results. When $e < p/d \leq e^2$, after a long time the solution behaves like a monotone traveling wave for a small time-delay, and behaves like an oscillatory traveling wave for a big time-delay. When $p/d > e^2$, if the time-delay is small, then the solution behaves like a monotone or nonmonotone traveling wave, but if the time-delay is big, then the solution is numerically demonstrated to be chaotically oscillatory, hence, unstable. Some other interesting numerical results shall be demonstrated too.

Joint work with Chi-Kun Lin , Yanping Lin and Ming Mei*.

欢迎大家参加!