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## 论文

### 基于TS模型的捕食与被捕食系统的脉冲同步研究

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摘要:

复杂生态系统存在随机性、模糊性和种群突变等脉冲现象的特点,利用T-S模糊模型的脉冲同步控制方法,以三种群选择性捕食系统和一类具有Holling功能反应的捕食-被捕食系统为例,研究了这类捕食与被捕食系统的脉冲同步问题。采用T-S模糊动态模型描述这两类系统,用Lyapunov稳定性理论设计出这两类捕食系统的全局渐近稳定的模糊脉冲同步控制器,研究这两类系统的脉冲同步问题和稳定性,反映为系统中的物种达到持续稳定的发展趋势。最后的数值模拟验证了此方案的有效性。

关键词: 脉冲控制; TS模糊模型; 同步; 捕食与被捕食系统

### Study on impulsive synchronization based on the T-S fuzzy model of prey predator systems

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Abstract:

There are the characteristics of randomness, fuzziness and impulsive phenomenon in the ecological system. Taking a three species selected prey-predator system and prey-predator with Holling functional response as an example, the T-S fuzzy dynamical model and impulsive synchronization of the systems were proposed. The fuzzy impulsive synchronization controllers were designed based on Lyapunov theory. The problems of the impulsive synchronization and the stability were obtained. The scheme makes the species arrive at a new state, in which they can coexist and develop. The effectiveness of this scheme was tested by simulation.

Keywords: impulsive control; TS fuzzy model; synchronization; prey-predator systems

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