

工程与应用

分数阶混沌系统时域数值仿真及其可靠性分析

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摘要 通过分析系统不动点的稳定性, 得到分数阶微分系统存在混沌的解析条件。以分数阶统一混沌系统为例, 通过时域数值仿真实验, 发现时域近似产生的仿真误差会产生对分数阶微分系统是否存在混沌的错误判断, 并且误差影响会随参数k的增大而变大。

关键词 [分数阶微分系统](#) [统一混沌系统](#) [数值仿真](#) [数值可靠性](#)

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Time-domain numerical simulation of fractional-order chaotic systems and its reliability analysis

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Abstract

The analytical conditions that the fractional-order differential systems remain chaotic are obtained by analyzing the stability of the fixed points of the systems. Taking the fractional order unified chaotic systems as an example, the numerical simulations illustrate that the errors of time domain approximation can cause erroneous results about whether the fractional-order differential systems remain chaotic, and the effects of the approximation errors will become worsen with the system parameter k growing.

Key words [fractional-order differential system](#) [unified chaotic system](#) [numerical simulation](#) [numerical reliability](#)

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