

## <<分数维非线性系统>>

### 图书基本信息

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### 内容概要

本书主要讲述分数维混沌系统，辅以Matlab程序进行仿真，并用图表展示其状态空间轨迹。书中对分数维混沌系统的描述清晰、易懂，提供的分析方法和数值解法简单易学，几种典型的分数维系统也用Simulink进行了仿真。通过学习本书，读者可以深入理解分数维微积分的基础理论，快速学会用分数维微分和积分方程来描述动力系统。本书可以帮助读者利用分数维混沌系统进一步研究更复杂的物理现象。

本书可供对混沌现象或分数维系统等感兴趣的数学家、物理学家、工程师参考，也可作为动力系统、控制论和应用数学研究生或本科生的教材。

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## 章节摘录

版权页：插图：It is well known that chaos cannot occur in continuous nonlinear systems with the total order less than three (Silva, 1993). This assertion is based on the usual concepts of order, such as the number of states in a system or the total number of separate differentiations or integrations in the system. The model of chaotic system can be rearranged to three single differential equations, where the equations contain the non-integer (fractional) order derivatives. The total order of the system is the sum of each particular order instead of three. To put this fact into context, we can consider the fractional-order dynamical model of the system. Hartley et al. introduced the fractional-order Chua's system (Hartley et al., 1995). In the work (Arena et al., 1998), the fractional-order cellular neural network (CNN) was considered, the fractional Duffing's system was presented in the work (Gao and Yu, 2005), while other fractional-order chaotic systems were described in many other works (e.g., Ahmad, 2005; Deng et al., 2007; Guo, 2005; Li and Chen, 2004; Lu, 2005a,b; Nimmo and Evans, 1999, etc.). In all these cases chaos was exhibited in a system with total order less than three.

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### 编辑推荐

《分数维非线性系统:建模、分析与仿真(英文版)》是非线性理科学之一。

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