

论文与报告

## 按段多重契比雪夫多项式系及其在线性时变系统辨识中的应用

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摘要

本文在块脉冲函数系和契比雪夫多项式系基础上定义了一种新的正交函数系—按段多重契比雪夫多项式系, 研究该函数系的主要性质和基本运算法则, 得出了积分运算矩阵、乘积运算矩阵和元素乘积运算矩阵, 并用此函数系研究线性时变系统的参数辨识问题, 获得了简单、快速、高精度的递推辨识算法. 数值例子计算结果表明, 当采用如伪随机信号一类的充分激励的函数作为被辨识系统的试验信号, 本文提出的算法所得结果的精度和计算时间都比一般正交契比雪夫多项式算法所得结果为好.

关键词 [正交函数系](#) [函数逼近](#) [参数辨识](#) [线性时变系统](#)

分类号

## Piecewise Multiple Chebyshev Polynomials and Their Application to Parameter Identification of Linear Time-Varying Systems

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Abstract

Based on Block-Pulse Functions and Shifted Chebyshev Polynomials (SCP), the orthogonal functions--Piecewise Multiple Chebyshev Polynomials (PMCP) is introduced in this paper. Main properties and basic operational rules of PMCP are studied. The integral operational matrix, the product operational matrix and the element product operational matrix are proposed. PMCP has been successfully applied to parameter identification of linear time-varying systems. Simple, rapid, accurate and recursive algorithm is obtained via PMCP. The results of the illustrated examples show that the algorithm presented is better than that via SCP for approximating piecewise continuous functions or the functions having severe variety, such as P. R. B. S.

Key words [Orthogonal functions](#) [function approximation](#) [parameter identification](#) [linear time-varying systems](#)

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