

数学

一类具弱奇性核Volterra积分方程的配置法求解

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摘要:

研究一类具弱奇性核Volterra积分方程的配置法求解. 利用压缩映射定理证明了该类方程解的存在唯一性, 构造了求解这类方程的配置算法, 并对算法进行误差分析, 数值实验结果验证了理论的正确性. 该数值方法可应用于更一般的非线性Volterra积分方程.

关键词: 弱奇性核 Volterra积分方程 配置法

Collocation Method for Solving a Class of Volterra Integral Equations with Weakly Singular Kernel

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Abstract:

The authors proposed a collocation method for solving a class of Volterra integral equations with weakly singular kernel. Firstly, we showed the existence and uniqueness of the solution by the contraction mapping theorem, and then constructed the collocation scheme for this kind of equations together with the error analysis. Finally, the numerical experiments verified our theoretical results. This numerical method is useful for general nonlinear Volterra integral equations.

Keywords: weakly singular kernel Volterra integral equation collocation method

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