近似非齐次无偏GM(1,1) 模型的递推解法及应用

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Recursive solution to approximate non-homogeneous unbiased GM(1,1) model and its application

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摘要

针对传统近似非齐次灰建模可能出现参数复数解的问题，提出无偏灰色GM(1,1) 模型的递推解法，从而减少由差分方程向微分方程跳跃而导致误差的问题。给出不同初始条件下非齐次无偏GM(1,1) 模型的递推预测公式,并在此基础上，将递推公式运用于时间序列分段，提出基于近似非齐次无偏GM(1,1) 模型的时间序列分段表示方法。实例结果表明，所提出的递推模型能够获得较高的拟合精度，分析结果验证了基于灰色预测模型在时间序列分段表示中的有效性和实用性。

关键词： 灰色GM(1,1) 模型, 非齐次指数, 递推解法, 时间序列, 分段表示

Abstract:

As there may be complex solutions in the traditional approximate non-homogeneous GM(1,1) model, this paper proposes the recursive solution to unbiased GM(1,1) model, which can reduce the errors from the differential equation to differential equation. And its predictive formulas are given under differentinital conditions with the recursive method. On this basis, by appling the recurisive formulas to time series piecewise representation, the method of time series piecewise representation based on the new model is proposed. The results show that the recursive model has higer fitting precision, and also verify the effectiveness and the practicability of the representation method of time series based on the grey forecasting model.

Key words: grey GM(1,1) model non-homogeneous exponential recursive solution time series piecewise representation

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