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基于超越几何规划的热轧操作优化问题

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Operation optimization problem of hot rolling based on the transcendental geometric programming

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摘要

针对钢铁热轧生产操作优化问题, 建立热轧操作优化模型. 该模型的难点是, 模型具有高度非线性的特征, 难以获得最优解. 考虑模型数学表达式的结构特点, 将操作优化模型等价转化为超越几何规划模型, 由于获得的模型 存在对数项, 无法直接有效求解, 利用模型的结构特点, 通过数学变换和理论分析, 转化为凸规划模型, 从而利用凸规划软件获得最优解, 为操作优化问题获得全局最优解提供一种新方法.

关键词 ： 超越几何规划, 操作优化, 热轧, 全局优化

Abstract :

A mathematic model is built for the operation optimization problem of hot rolling. It is difficult to get global optimization for the operation optimization problem that has highly nonlinear characteristic. Considering the structural characteristics of the mathematic model, the operation optimization model is turned into a transcendental geometric programming model. The transcendental geometric programming model which is transformed from the operation optimization model of hot rolling cannot get the global optimization directly because the model has logarithmic terms. Based on the model structural, some theoretical analysis and mathematical transformation are given, which can help the operation optimization model of hot rolling transform into a convex programming model. Convex programming software can be used to solve the convex programming model.

Key words : transcendental geometric programming operation optimization hot rolling global optimization

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